GrummanWorld

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O'Brien: We Won A Major Victory This Year, But The Budget Battles Will Continue In 1990

Grumman World: *What impact do you think the easing of U.S.-Soviet tensions will have on the U.S. defense industry?*

O'Brien: The world is changing. We have bankrupted Russia. Now we don't have a reliable enemy anymore. For 40 years we had an enemy we could count on. However, the U.S. has commitments throughout the world. We must be able to defend ourselves against Russia in case Gorbachev is not successful. We've got to be able to defend ourselves against the Khadafys of the world. We've got to be able to protect our national interests. At the same time, we must cut defense expenditures.

We must remember that the defense budgets have been coming down for the past five years. And Grumman has managed to maintain its position in the defense industry in those declining years.

Last month, the Secretary of Defense asked the three branches of the Armed Services to draw up plans to cut $180 billion from the defense budget over the next five years. He wants to know what our defense plan would look like in the next decade. I think Dick Cheney is doing the right thing.

It's far better to have a plan than to go around shooting every rabbit that sticks its head out of the ground and finding out when you're all finished that you have no bullets and no dinner. Which is the way we were headed. So I endorse what he's doing.

Grumman World: *What impact will those changes have on Grumman?*

O'Brien: It's still to early to call, but I think we could come out in very good shape. Just look at where we are. We've kept the F-14 alive until calender year 1993. That allows us to devote time and money to the Tomcat-21. Due to the budget cutbacks, I believe ATF and the NATF development will be stretched out and the planned rate decreased.

Now if the U.S. decommissions two aircraft carriers, it'll be the two older carriers — and they don't have any F-14s on them. There are only F-18s on those older carriers. That makes for a lot of surplus F-18s and no surplus F-14 Tomcats.

As an advanced technology development program of an existing fighter, Tomcat-21 fits an austere budget. When you look at a major program like an ATF or an NATF, it's a commitment to spend billions of dollars because you can't take a $13 billion aircraft program and say, "Let's cut that commitment to $2 billion," and expect to get anything out of it. Now you can take a Tomcat-21 which is a derivative of an F-14 and say, "The next major improvement that I'd like is a digital flight control system. That's going to cost X amount. Let's do that."

'I'm fairly optimistic that when it all shakes out, we could turn out to be the little darlings of the industry'

And you have a useful improvement to a product after spending that amount.

In other words, you can't half build a house. You can't decide to build a 10-bedroom house and only put up the kitchen and sleep in it. That's the problem with any new major program. However, you can improve a product you have and incorporate new technologies in it for a lot less money than developing a whole new product.

I'm fairly optimistic that when it all shakes out, we could turn out to be the little darlings of the industry. With our products, the DoD wouldn't upgrade everything all at once. Just do it slowly, at low cost, gradually over the next decade.

Of course, it's going to be a very interesting time. Do I think we should be nervous? Probably. Do I think we should run to greener pastures? Where are the greener pastures?

You've got General Dynamics, McDonnell Douglas, Lockheed and Northrop pouring hundreds of millions of dollars into the ATF. How are they going to get their money back? Is the ATA going to be slowed down? All of these companies are going to go through some tough times.

Grumman World: *What has Grumman been doing to sell the Tomcat-21 to the Pentagon and the Navy?*

O'Brien: We have continued to advise the Navy about the Tomcat-21's potential. There are probably four dozen variants of Tomcat-21. We've done very little to sell the DoD part of the Pentagon because there is really no value in selling the DoD unless we've sold the procuring agency — the Navy.

Right now, we're supplying information on the Tomcat-21 capabilities to support the various studies that the Navy's conducting.

Do they really need an NATF? Do they want a variant of the F-18, called the Hornet 2000? Do they want a Tomcat-21?

I believe we're getting a pretty good reception from the Navy people about what we can do with an F-14D to make it a weapons systems viable out through the next decade.

Grumman World: *What is our future as systems integrators?*

O'Brien: That's where the defense dollars will be.

If the U.S. is going to cut back on the size and the deployed capabilities of the Armed Forces, it is going to have to use its technology to enhance its defensive capabilities in the world. We're signing peace treaties with the Soviets, and we'll need surveillance systems to verify compliance. We've

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O'Brien: Our Systems Integration Capabilities Will Be In Demand Throughout The World

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got two major surveillance systems: BSTS and Joint STARS.

We're competing for BSTS, which is a sensor system with a potential to be a $10 billion program over the next decade. The sensors in space have to be replaced to defend this country. There is no choice, even if everyone is in love with everybody else. We are going to watch what's going on. And that's what BSTS does.

We've got Joint STARS going into production in the '90s. That's another open skies surveillance system. So if the Russians are going to withdraw 100 kilometers, we're going to want to watch and make sure it's not 99. The Germans, French and British will want to watch, too. Joint STARS is another $10 billion program.

I think our systems integration capabilities — which we are demonstrating to the Air Force and the Army on Joint STARS and as we'll demonstrate on BSTS to the Air Force — are going to be more and more in demand throughout the world.

Grumman World: *Will Grumman's international sales continue to grow in 1990?*

O'Brien: I think so. We did very well in bookings in 1989. It looks like we will have booked about $850 million in sales for future deliveries. I'm very optimistic. We just got word that the Japanese have approved the three additional Hawkeyes in their next budget. We have approval to talk to foreign countries about buying the EA-6B; there's more potential there. The S-2 is coming along very well. I'm very optimistic that we can have at least as good a year in '90 as we had in '89.

Grumman World: *What about the European community in 1992?*

O'Brien: I see a great need for that community to buy Joint STARS. Whether it will be Joint STARS as it's conceived for the U.S. Air Force and Army or whether it will be Joint STARS in a European community air frame, I don't know yet. We're putting Joint STARS in 707s. There are a lot of 707s in Europe that could be modified to accommodate Joint STARS. So there is synergy there. I have no doubts that we will make some successful sales in Europe.

The European community is going to have a tremendously capable aerospace industry. Obviously it is going to be tougher to sell to them as a community than as individual countries. The U.S. influence as an economic giant is going to be less with the European community than it was with individual countries. It will be very interesting to watch how these countries handle their individual defense obligations and treaties as a community.

'We've got some time to plan for all of our aircraft programs'

Grumman World: *1989 was Grumman Quality's (GQ) first full year of operation. Is it working? Has it changed the way we're doing business?*

O'Brien: Yes, it's working. Yes, it's very slowly changing the way we do business. Yes, I am impatient with its progress because I am by nature impatient. However, I'm not letting my impatience overcome my very realistic view of how fast you can make a giant change. And Grumman is a giant bureaucracy because it's got 30,000 people in it. The average age is in the 40s and the average service life is 13 years. With those statistics, you have a lot of people doing things out of habit. They think that they are doing their jobs very well and they probably are. But it may not be the best way.

Grumman World: *Are there any areas where you do see a remarkable improvement?*

O'Brien: I'm not sure that I'm looking for remarkable improvement even though I'm impatient. I'm looking for a steady improvement — a steady cultural change in this company — that individuals can change this company for the better.

I think it's a gradual philosophical change. We have a lot of people checking up on what a lot of other people around here do. I want people to do it right the first time and then we won't need so many people checking up. And that's what GQ is all about.

I have seen a remarkable improvement in our production capability. In 1988, Grumman spent about $27 million redoing things that had been done wrong. Today, I see our rework rate going from an all-time high to an all-time low in the course of 12 months. That's outstanding. It shows that we can change and by God we *can* do it right the first time. All we have to do is to *want* to do it right and then do it.

Grumman World: *We won a major battle when funding for new F-14D's was included in the fiscal 1990 defense budget. Some say that we antagonized too many people. Have we?*

O'Brien: We had a well-thought out campaign. We conducted that campaign professionally. We never criticized anyone or anyone else's products or actions. We took a position and we maintained it. Our position was that this country needs F-14s to protect it. We never made it a jobs issue, because if you're going to take $10 billion out of the defense budget, somebody in the United States is going to lose a job.

Did we antagonize some people? You can't have a fight that strong and emotional without hurting some people you'd rather not hurt. One of the people in Washington said our campaign was ruthless. Well, I think that people would expect me to be ruthless when our major product is being attacked. I think they'd be disappointed if I weren't. When you're ruthless you hurt some people.

But we never criticized anyone. That's not our style as a company or mine as a leader of this company. Did we antagonize some people? Obviously. As the wounds heal will they forget it? I think so. That's the way Washington life is in most cases.

'Defense budgets will be cut, but they're still going to be a very large part of our country's budget.'

Grumman World: *Will there be layoffs in 1990?*

O'Brien: Yes, there will be some reductions.

Just look at what happened this year. We started off 1989 with close to 32,000 people. Today our work force is around 29,000. About 1,900 were laid off and another 3,900 people left the company, either to retire or get another job. Plus, we hired 2,800 people this year in certain skills that we needed. That's the nature of our business, and that's not going to change.

Our needs will continue to fluctuate. Even though we won a major battle in the F-14, we didn't get the EA-6B's or the A-6s restored. Now, we'll be building 12 EA-6B's in 1990, and seven more in '91. We'll build only one A-6 next year, but nine of them the year after. Obviously, that causes us some problems – but it's hard to tell what may happen.

Just last month Congress suggested that the Navy consider reprogramming funds for the EA-6B. As for the A-6, does the U.S. really need a multi-million dollar replacement for the Intruder? We'll probably get some more A-6 modifications before we're finished. In addition, we

have plenty of rework and modification projects for both aircraft. We've got some time to plan for all of our aircraft programs. As our business base changes, there will be a shift in skill needs. If we win

'We need people to hang together and think smart.'

BSTS, there will be a need for people in different sciences and technologies. There will be growth if Joint STARS goes into production. So, we've got all kinds of offsets to our business base. The process of assessing these impacts is continuous. Attrition helps to some degree where the skills are not essential — but we will need to make some additional staffing adjustments.

Grumman World: *What kind of year do you think 1990 is going to be?*

O'Brien: It's tough to forecast 1990. I think there will be lots of opportunities for us. Defense budgets will be cut, but they're still going to be a very large part of our country's budget. We have to be smart enough to learn how to participate in that to the best of our ability. And I think we are.

It's going to be a disquieting year to most people because it's going to be a year with lots of changes. Just look at what's been going on in Europe over the past few weeks.

I think when the defense budget studies come out early next year, it's going to be disquieting. For all I know, the first budget study may say eliminate all aircraft carriers. And the newspapers are going to blow that up in a big headline and all of our people are going to be upset. On the other hand, the DoD could come out and say we are going to cancel the ATF and the NATF and all of our people are going to be euphoric until that settles down.

So it's going to be a tough year for Grumman people, and some of them are going to leave us because they can't handle the pressure and tension. We need people to hang together and think smart. We have to be responsive to our customer's needs.

Change is hard for people to accept. All of us resist change, including me. Most of what we do we do out of habit. We've got to change that and we're going to be forced to change. That's going to upset people. All I can say is to stay loose, do your job the very best way you can, stay calm and we'll come out of this in great shape.

Thanks For Giving Us Your Best Shots

We couldn't have producted this issue without the help of the Grumman Photographic Services department and our "correspondents" at off-Long Island sites.

A special thanks to photographers: Rich Breunig, Gerry Costello, Ross Cruden, Ken Kohler, Ken Johnson, Ed Payne, Harry Prodromides, Ray Sander, Bob Sagliocca, Bob Settles and Marie Trimborn.

We'd like to thank all the other people who helped us all year: in Transportation, Distribution Services, Repro Services, the mailrooms, and Facilities, to name a few. We also want to thank the people who fill out those readership surveys, and everyone who calls us or writes to us with story ideas, criticism, compliments and comments.

A safe and happy holiday to all.

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Let Us Know

We don't want to do all the talking. We'd like to know what you think about the things you see on these pages. Your comments, suggestions and complaints are welcome. Please take a few minutes to give us your opinions.

Send your letter to:
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Mark Of Quality. *Grummanites deliver excellence on a wide variety of projects. Lori Cincotta and Barbara Bowen are systems engineers for the Electronics Systems Division's Display and Trainer Products Group, Bohemia, Long Island.*

Our Values

Grumman people have developed a set of shared values that create a sense of who we are and what differentiates us from other companies.

Our business purpose is to understand thoroughly our customers' needs and expectations, provide quality products and services that meet those needs and expectations in a cost effective manner and provide our shareholders an attractive return on their investment.

We believe in providing leadership that stimulates teamwork and mutual respect, encourages creativity and rewards individual performance.

Our corporate personality is shaped by the development and application of advanced technologies.

We attach great importance to dealing with people honestly and fairly. This governs our relationships with our customers, with our suppliers, with our community neighbors and with one another in the company.

In all our activities we are driven by the understanding that this is our company and that each of us has a personal stake in its future. We realize that our success as well as our corporate character depend on the total quality of the work done by each one of us.

More Grumman Pride. *Dennis Ruffini is an avionics assembler in A-6/EA-6B Final Assembly, Calverton, Long Island. Ruffini is installing an EA-6B computer display indicator.*

Grumman's Business Takes On A Global Profile

With U.S. defense budgets declining, Grumman is putting even more emphasis on sales to overseas nations. In 1989, Grumman will have over $850 million in international sales, twice the total of the year before.

In 1989, Grumman will have over $850 million in international sales, twice the total of 1988.

Grumman International, the foreign sales subsidiary, aims to achieve the $1 billion sales mark next year. It is marketing its products and services to 24 foreign countries. Grumman has a dual focus: both sales of existing products, including Grumman aircraft and electronics systems, and cooperation with foreign firms to develop new products.

The E-2C Hawkeye has been sold overseas to Egypt, Japan, Singapore, and Israel, and is the mainstay of Grumman's foreign marketing efforts. On November 29, the Japan Defense Agency signed a letter offer and acceptance for three additional E-2C's; Grumman has already sold eight to that country.

The Navy and Grumman will negotiate the final contract in the near future. The contract will be worth $175 million in business to Grumman, and the deliveries of the planes would start three years from now.

Grumman is marketing the E-2C to other Pacific Rim countries, including Korea, Thailand, and Indonesia. Grumman plans to market the E-2C to France, Greece, and Turkey. Grumman also plans to propose to the U.S. Coast Guard a C-130 equipped with the E-2C's capabilities; it will market this capability to Australia and Malaysia as well.

The S-2 Tracker is an antisubmarine aircraft developed by Grumman in the 1950s.

In Europe, Grumman's first priority is selling Joint STARS to NATO countries.

Grumman has done overhaul and maintenance for Argentina and Turkey. More recently, it developed a kit to provide new engines and avionics for a Pacific Rim country's S-2s. Grumman is marketing these kits to the dozen other foreign countries that own S-2s.

The F-8 Peace Pearl program is now under way in Bethpage for the People's Republic of China. Under this contract, Grumman and the Chinese are working together to upgrade the F-8 aircraft's avionics systems.

Grumman is also in a joint venture in China to build new firefighting equipment for that country; several European companies are also on the team.

The DoD gave Grumman a green light to brief Japan and Korea on the possible sale of the EA-6B Prowler.

This past summer, Grumman formed a joint venture to market computer systems integration in Singapore. The firm, Grumman-Singapore Computer Systems Private Limited, will specialize in software for design and manufacturing.

In Europe, Grumman's first priority is selling Joint STARS to NATO countries. A new Grumman office opened at NATO headquarters in Brussels, Belgium. It will focus on marketing Joint STARS as well as the Integrated Family of Test Equipment (IFTE).

In April, the Joint STARS aircraft will fly to Europe for a 30-day field demonstration for NATO senior commanders. Representatives of German, Norwegian and Italian armed forces will be in attendance.

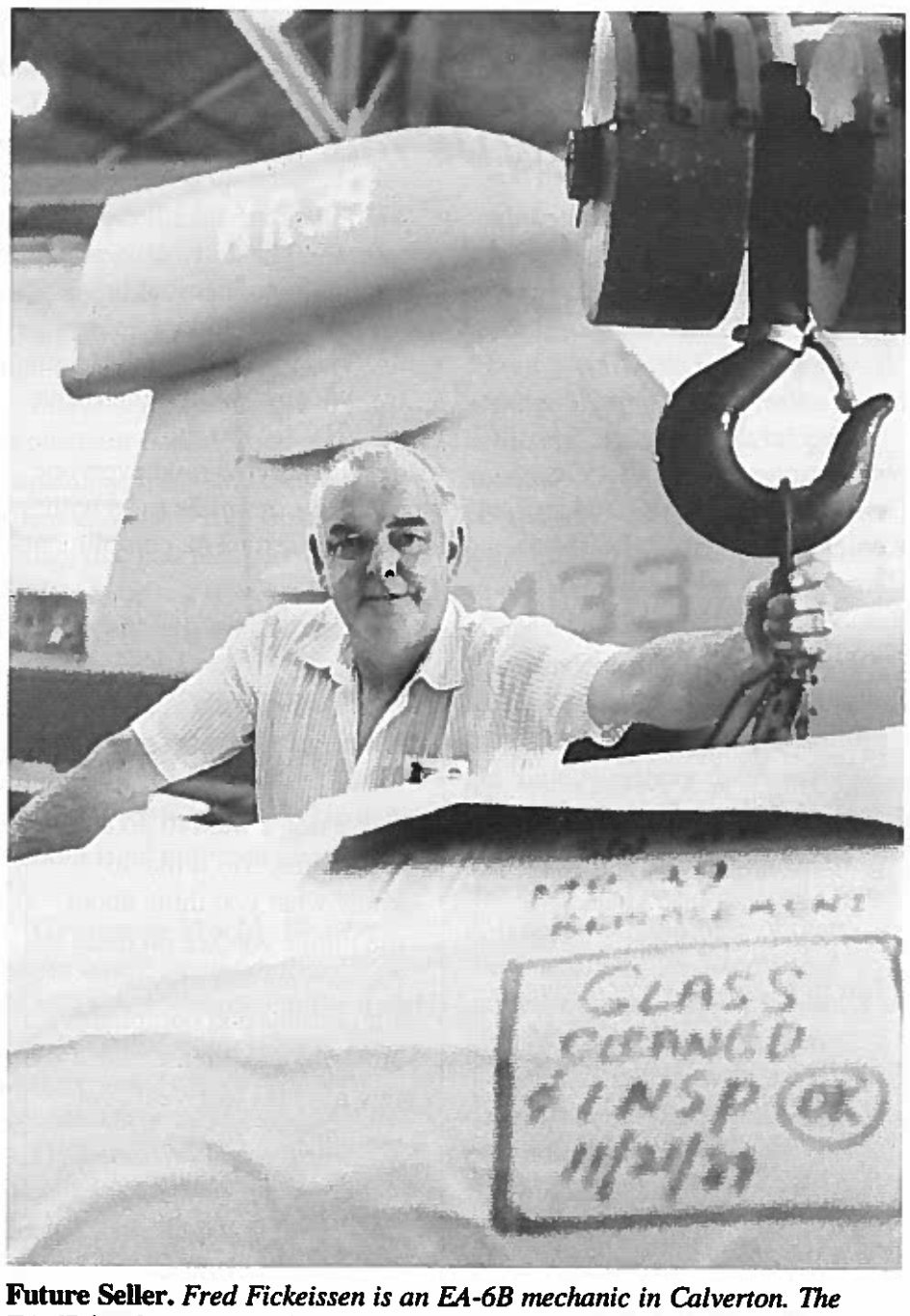
This fall, the Navy released the EA-6B Prowler for foreign sale to North Atlantic Treaty Organization and certain Pacific Rim countries. The DoD gave Grumman a green light to brief Japan and Korea on the possible sale of the EA-6B Prowler.

Foreign Sales Flagship. *An E-2C Hawkeye undergoes ground tests in Bethpage. The E-2C Hawkeye has been a popular seller overseas. Recently, the Japan Defense Agency agreed to purchase three more E-2C's.*

Grumman will also market IFTE; the Penguin missile; space services; and command, control, communications, and intelligence systems to Pacific Rim countries.

Much of the work done by Grumman's Aerostructures unit is for overseas aerospace firms, including British Aerospace and Fokker.

Grumman is now negotiating agreements with five European countries for future co-development projects and shared marketing of products. These include: Deutsche Aerospace, Siemens, Thomson SA, Dassault, and M.A.N.



Future Seller. *Fred Fickeissen is an EA-6B mechanic in Calverton. The EA-6B has been released for foreign sale by the Navy, and the Defense Department gave Grumman permission to brief Japan and Korea on it. The Prowler is currently the only electronic warfare aircraft in production.*

What Kind Of Work Grummanites Are Doing

F-14

The F-14 program proved it was a fighter, enduring a drawn-out political battle in Washington D.C. this year. Grumman and its supporters were able to convince Congress that the Navy needed new F-14D's in the fiscal 1990 budget. In the end, both the 1990 defense authorization and appropriations bills included funding for 18 new F-14D's, and the president signed both bills into law in November.

The program, which employs over 4,000 people, posted a number of other achievements this year. The F-14D development effort successfully completed some Navy operational tests, and the first firing of live weapons occurred. In addition, Aircraft number 7, the F-14D development plane, showed that it could fly supersonically without using afterburners.

The F-14A(PLUS) was cleared for carrier operations by the Navy and the first new production F-14D began final assembly in Calverton. The F-14A to F-14A(PLUS) retrofit program was to be completed this month, and a contract was awarded to start the F-14A to F-14D remanufacturing program. That contract calls for four conversions by Grumman and two sets of conversion materials for the Navy Aviation Depot in Norfolk, Virginia.

Next year, the F-14D will go through a major technical evaluation in March and another major operational evaluation from May to July. The F-14A(PLUS)/ F-14D full scale development program will end in 1990, but Grumman will deliver the first new F-14D production plane in March. Grumman will also receive the first three F-14A's that are to be converted to F-14D's.

Advanced F-14

The Advanced F-14 will be an all-weather combat aircraft that will substantially enhance the current Tomcat's performance in fighter and strike missions. In its strike role, the Advanced F-14 will be able to use a variety of air-to-ground weapons. This combination will give the Navy more operational flexibility and multimission capability. The plane will feature extended mission radius, advanced avionics and weaponry, enhanced survivability, vehicle modifications and other design improvements.

While Grummanites generally think of the next generation F-14 as Tomcat-21, that name really refers to one version of an advanced F-14. Moreover, Tomcat-21 has grown to become Super Tomcat-21. In 1989, three different Advanced F-14 configurations were defined. Going in order from the easiest, quickest and least expensive upgrade to deliver to the most sophisticated and advanced, they are named: Quick Strike, Super Tomcat-21 and ASF-14.

This year Grumman engineers designed and demonstrated, using the company's low-speed wind tunnel, a new high-lift system that is a cornerstone of any Advanced F-14 design. They also began simulations of digital flight control systems, inexpensive long range stand-off weapons and improved carrier landing systems.

Next year Grumman plans to begin refining an Advanced F-14 weapon system configuration, using the Simulations/Systems Development Lab. Wind tunnel testing at national facilities is also planned, as is the development of a full-scale mock-up of a crew station.

A-6

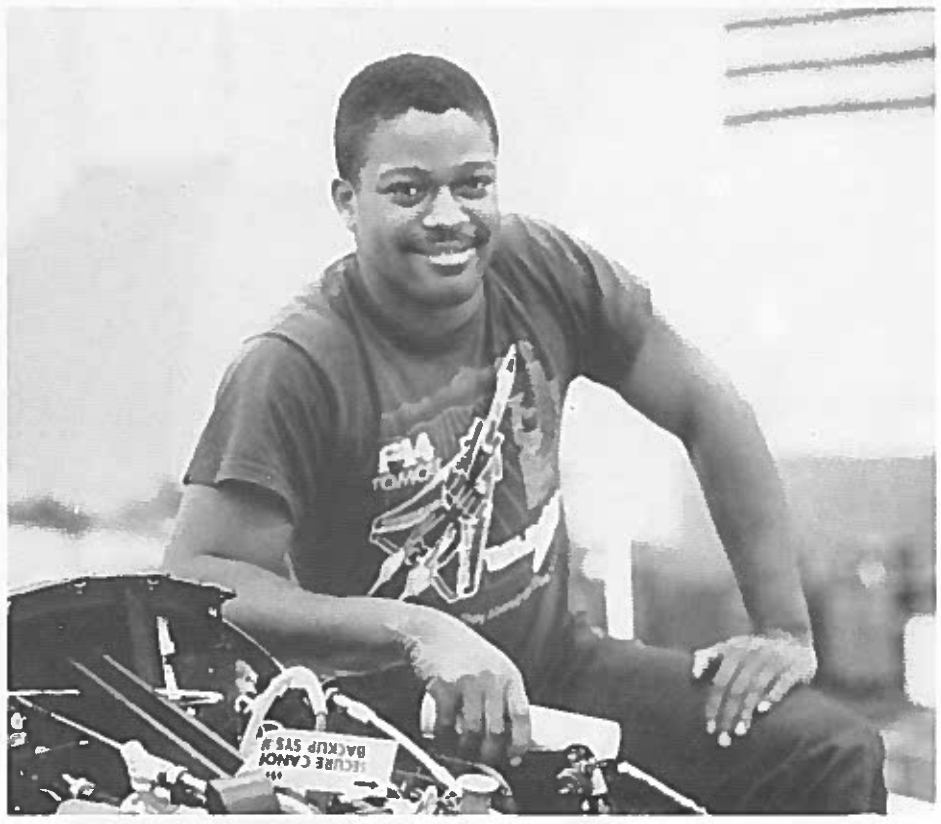
The A-6 program faces an uncertain future. There was no funding for new A-6s in the 1990 defense appropriations and authorization bills, though there was funding for modification work. That means that Grumman's A-6E production line will continue until September 1991, when Grumman delivers the last new A-6E. Even so, the Navy is taking steps to deal with a possible shortage of these medium attack aircraft in the fleet. One move being made is a swap of Marine A-6E's for Navy F/A-18s.

About 2,000 people work on the A-6 program. This year the 400 people who worked in Melville, Long Island, moved to Calverton, where final assembly and flight test work is done. In 1989 Grumman delivered the first retrofit and the first production planes with the Boeing composite wing.

Delivery of kits for the Block II Modernization program will start in 1990. This includes night vision capability, a new video tape recorder and other enhancements.

E-2C/C-2A

This year, the E-2C Group I upgrade package became carrier-qualified at Patuxent River, Maryland. Group I includes more powerful engines and improved cooling, computer and radar systems. Six Group I Hawkeyes were delivered to the Navy.



A Heady Year. *Herbert Allen works on F-14 Tomcats in Calverton as an environmental control system/ordnance installer. This year, the Tomcat survived a long political battle in Washington, D.C.*

In 1989, the Secretary of the Navy gave the go-ahead to incorporate Group II improvements into production aircraft starting in 1991. The Group II package features a dramatic improvement in radar and IFF detection ranges. It will also automate some tasks now performed manually and provide a color display of target information.

In December, Japan signed a letter of offer and acceptance for the purchase of three new Hawkeyes, paving the way for a contract. The planes will be delivered in approximately three years.

The last C-2A Greyhound transport will be delivered to the Navy early next year. With Greyhound production ending and the Bethpage runway closing, E-2C production will move to Calverton during 1990.

Over 2,500 people are working on the Hawkeye and C-2A Greyhound programs.

EA-6B

The EA-6B Prowler is an electronics countermeasures aircraft, jamming enemy radar. The first flight of the next generation Advanced Capabilities (ADVCAP) aircraft took place in October. It incorporates a new Receiver Processor Group and ALQ-149 communication/ jamming system. Grumman received authorization for an EA-6B vehicle enhancement program. Twelve Increased Capabilities-2 (ICAP-2) production and 11 ICAP-2 modification aircraft were delivered on schedule this year. Authorization came in August for the next production block update, Block '89. The Navy released the ICAP-2 for foreign military sales to various NATO and Western Pacific countries. In 1990, 12 new production and 10 modified ICAP-2/Block '86 aircraft are slated to be delivered. However, funds for new EA-6B's are not currently in the fiscal 1990 Defense budget; these aircraft would be built in 1993. Grumman's ADVCAP flight tests will wrap up in September; the plane will be turned over to the Navy for development and operational tests. 1,619 people work on the EA-6B program.

OV-1/RV-1

The Mohawk is an Army battlefield surveillance aircraft that was last produced by Grumman in 1970. But the planes have undergone a number of upgrades over the years. Today, nearly 200 Grummanites are involved in Mohawk programs at Aircraft Systems' Stuart Operations in Florida.

In 1989, Stuart completed the prototype OV-1D to OV-1E conversion aircraft. Stuart is now converting a second pre-production aircraft. An ongoing restoration effort involves OV-1D/ RV-1D planes at the rate of one and a half a month. Plus, there is a service life extension program for the planes. This will let the Army keep Mohawks in its fleet until 2005, when the planned replacement, the Army Special

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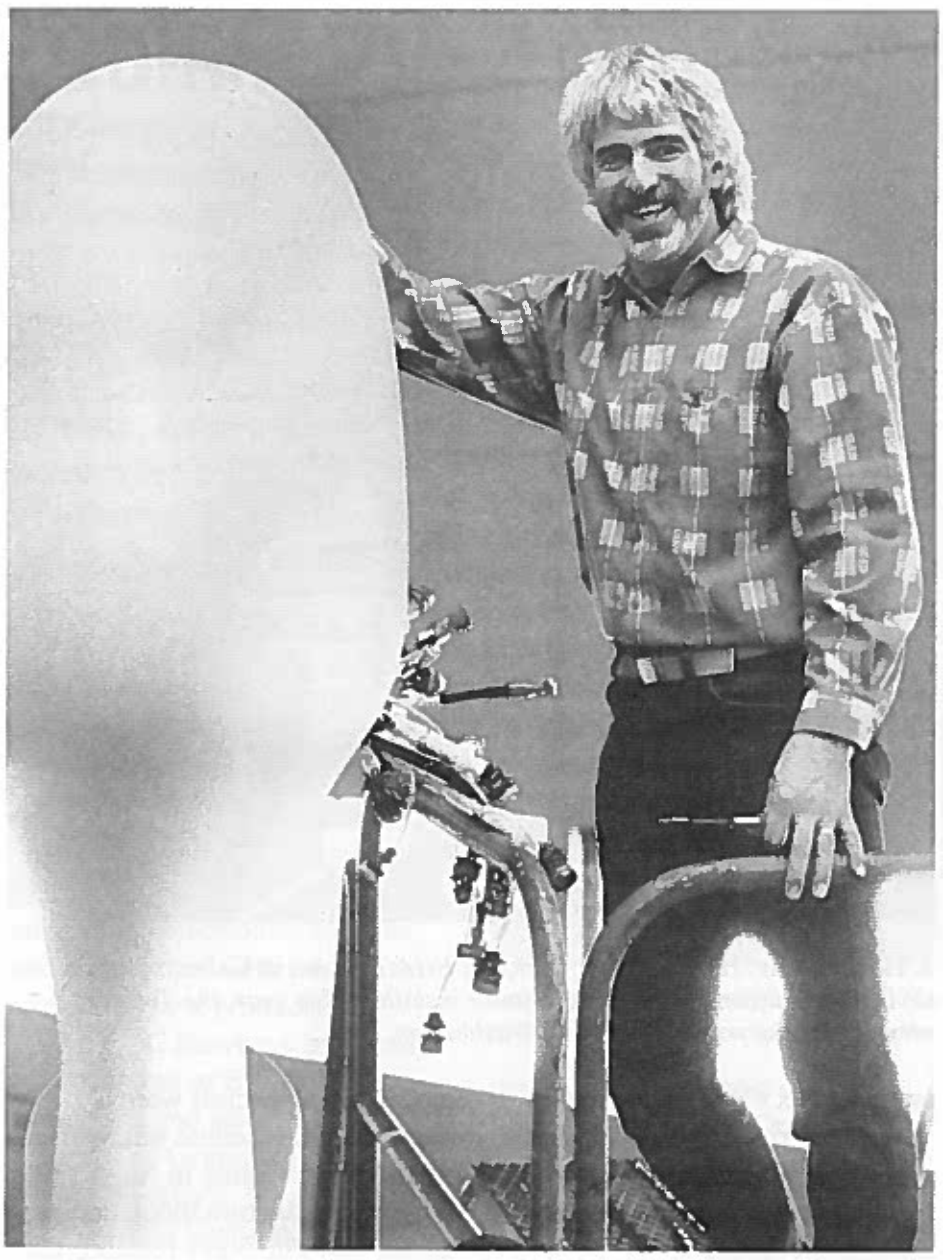


High-Tailing It. *In Calverton, Larry Swank works on a scaffold to connect the avionics in the tail of an EA-6B Prowler. Though there was no funding in the fiscal 1990 defense budget for Prowlers, the Navy was told it could reprogram money for the planes if its shortage is serious.*

(Continued from page 5)

Electronic Mission Aircraft, will be ready.

In 1990, a production run of 35 OV-1D to OV-1E conversions will begin and the restoration and life-extension programs will continue.

A-10

The Air Force A-10 close air support aircraft was originally produced by Fairchild Republic, but it became a Grumman program in 1987. Grumman won a $30 million contract in 1988 for the Low Altitude Safety and Targeting Enhancement (LASTE) kit. In 1989, Grumman successfully installed the LASTE prototype kit. The 90-member team delivered the first article kit six months ahead of schedule, giving Grumman a $500,000 incentive award. The first 110 production kits, built in Great River, L.I., and St. Augustine, Fla., were delivered five months ahead of schedule. Grumman received production authorization for Lot II — 220 kits. Grumman expects to deliver 165 kits in 1990.

Aerostructures

This unit of the Aircraft Systems Division markets Grumman's design and manufacturing skills for military and commercial aircraft subcontracts. In 1989, the first shipset of C-17 composite control surfaces was delivered to McDonnell Douglas, as well as the 300th shipset of 767 wing center sections to Boeing. Grumman was awarded Boeing's "Pride In Excellence" award for the fifth consecutive year.

Grumman won several tooling and detail parts offloads from Boeing, McDonnell Douglas, General Dynamics, and other aerospace companies. The updated S-2T turbotracker took its first flight and the first is expected to be delivered in 1990. The GE CF6-80C2 transcowl program (210 units) is scheduled for completion; a follow-on award is expected next year, too. About 1,300 Grummanites work on Aerostructures programs.

Joint STARS

The Joint Surveillance Target Attack Radar System (Joint STARS) is being developed for the U.S. Air Force and Army. It will detect and locate ground targets and guide aircraft and missiles against enemy armored and support forces. In 1989, Joint STARS aircraft no. 2 completed its first functional check flight with its new Raytheon VAX computers. The system's radar moving target indicator capability was successfully flight tested for full wide-area surveillance.

The Joint STARS aircraft demonstrated the capability to downlink live radar data to the Army's ground station module. Joint STARS was also demonstrated for officials of four NATO countries.

In 1990, Grumman will complete full scale development in preparation for systems level performance verification testing by the government. The operational field demonstration will take place in Europe. Grumman also hopes to receive authorization for a third Joint STARS aircraft.

About 700 people work on the Joint STARS program.

BSTS

The Boost Surveillance and Tracking System (BSTS) is a planned network of infrared-sensing surveillance satellites. BSTS will make up a major portion of the first tier of a three-tiered defensive shield being developed by the Strategic Defense Initiative Organization and managed by the Air Force to protect against or deter a ballistic missile attack. Such satellites will work by sensing the "signature" of individual missile types. From a stored data bank of signatures, these satellites will be able to read a signature, instantly compare it to the stored data and determine whether the signature is that of an enemy missile.

Grumman Space Systems is the prime contractor on one of the two teams competing for this major contract. Lockheed leads the other. Grumman completed its ground demonstration facility this May, and a target scene generator and BSTS telescope were delivered there on August 2. The Irvine facility sent the first focal plane sub-array to Bethpage on August 30. The first enhanced focal plane is to be delivered in December.

The ground demonstration test is to be next March. The final design review will be held in May.

Space Shuttle Processing Contract

These Grummanites in the Technical Services Division maintain the computer software and instrumentation used in space shuttle launches. Six successful shuttle launches took place in 1989. Grumman also was awarded the third contract option period, extending it from October 1, 1989, through September 30, 1992. Grumman extensively refurbished calibration, measurement, and launch processing system equipment. Technical Services was also named a NASA Excellence Award finalist. Nine shuttle launches are planned in 1990. There are 731 people on the Shuttle Processing Contract.

Space Station Program Support

The Grummanites on this program assist NASA in the systems integration of the Manned Space Station. The first parts of the station are scheduled to go into orbit in the late 90's . In 1989, Grumman's role on the program was expanded. But due to this year's budget cuts, the program will be stretched. Grumman had functioned as a mirror image of NASA. The Grummanites worked side-by-side with their NASA counterparts on identical assignments. Grumman will now work on specific integration tasks — the division and NASA are now defining what those will be. The major milestone ahead for 1990 is the preliminary design review of the station. There are about 450 Grummanites on this program.

DMMIS

The Depot Maintenance Management Information System (DMMIS) is a management information system developed by Data Systems for the Air Force Logistics Command. It will be used by logistics centers throughout the U.S. DMMIS successfully completed two key reviews this fall and training of Air Force people began. The critical design review was successfully completed for Ogden Air Logistics Center in May, and Grumman received the green light to implement the system for the remainder of the center. The preliminary verification review is scheduled for January, with a final review in October. Four major reviews for Ogden remain, all scheduled for 1990. Grumman will begin requirements analysis of engine divisions at San Antonio and Oklahoma City in January. Eighty Grummanites work on DMMIS.

Engineering Computation Facility

This Data Systems project is for a high-speed computer processing system to support the engineering and scientific community at Johnson. The contract was signed

August 25; system acceptance is scheduled by December 31. In 1990, Grumman is scheduled to begin supporting the computer system. Thirty Grummanites are working on the program for the integration phase; 10 will work on the support phase.

HSRP

The Headquarters Systems Replacement Program (HSRP) is a Data Systems contract to replace 23 computer systems operated by the U.S. Air Force in the Pentagon. The information managed by the system includes budgets and planning, tactical information, and administration. In 1989, the first two of the systems were installed, tested and accepted. Grummanites began converting 1.5 million lines of software code. In addition, over 650 hours of training were conducted for the customer. In 1990, Grumman will complete the design of the system's operational control center. Forty-five people work on the program.

ATACC

Advanced Tactical Air Command Central (ATACC) is a mobile command and control system developed by Data Systems that will be used by the Marines to coordinate air operations. The ATACC system requirements review was completed May 5, and the system design review on October 26.

The preliminary design review of system hardware is scheduled for February 15, system software will be reviewed March 5 through April 16. The critical design review of system hardware is planned for October 15; system software, June 7 through August 29. There are 71 people on the ATACC program, which is based in Springfield, Virginia.

Simulation/Trainers

Electronics Systems Division's Simulation/Trainer unit develops trainers for aircrew, operator and electronic warfare officers.

In 1989, 40 Grummanites were busy with the Aircrew Trainer Suite program, which is being developed for the Naval Air Systems Command. The program will provide advanced flight simulators that will be used to train crews of F-14D and A-6E aircraft. In 1989, critical design reviews were completed for two F-14 trainers: the mission flight trainer, which will cover basic flight procedures, and the weapons system trainer.

In October, Grumman was awarded a contract to build an E-2C tactics trainer for the Egyptian Air Force. Thirty-five Grummanites in Electronics Systems are designing, developing and building the trainer. The trainer will teach the Egyptian crew how to use the Hawkeye's airborne target detection and tracking systems. Aircraft Systems will prepare the course and provide the actual training. A preliminary design review is expected in the third quarter of 1990.

Trainer Team. *Software engineer Alyssa Perri and systems engineer Reg Conkling at work at the student station of the E-2C tactics trainer that Electronics Systems is developing for Egypt. A preliminary design review is expected in the third quarter next year.*

IFTE

The Integrated Family of Test Equipment (IFTE) is the next-generation automated tester for the Army. There are 225 people working on the program.

IFTE is being built by an Electronics Systems Division unit, Test Equipment Products. IFTE is designed to troubleshoot any weapon system the Army now has in the field or plans to develop. There are three basic pieces of hardware. The Base Shop Test Facility is mounted on the back of a truck and can go to the front lines to reach a faulty tank, missile system or the like. A soldier goes to the weapon with the Contact Test Set to isolate a broken component, which is brought into the Base Shop Test Facility for further work.

What allows these two units to analyze different weapon systems are test program sets — computer programs written for each weapon. Test program sets are being developed on the third major IFTE component: the Commercial Equivalent Equipment. This is to be used in Army depots and by weapon system manufacturers in their factories.

In 1989, the full-scale engineering development program ended and Grumman got the initial production award for the Base Shop Test Facility and Contact Test Set. Furthermore, a Contact Test Set upgrade was approved. Recently, IFTE was selected to support the Global Positioning System joint service program, making a total of 15 weapon programs signed on to use IFTE and about 15 more moving in that direction. A major follow-on production contract for Commercial Equivalent Equipment is expected before January 1, 1990.

Next year, Grumman expects the award of the fiscal year 1990 production option. It will deliver the first Base Shop Test Facility and Contact Test Set production units, and will also make the first IFTE-related foreign sale.

Trucks, Boats, Emergency Products

Grumman Olson forecasts deliveries of 11,600 truck bodies for 1989, compared to 12,900 in 1988. "While our walk-in sales are on plan for 1989, our cutaway van sales have been slow," says Bob St. Germain, assistant to the president of Allied. "However, we just introduced our new Freight Star van and already have received an order for 540 vans from Budget Rent-A-Truck. The outlook for 1990 is excellent."

Grumman Boats expects to deliver 14,000 of its aluminum fishing vessels and canoes by year end. That compares to about 17,000 last year. "After seven consecutive years of record sales, high interest rates and consumer demand are slowing down the whole boating industry," he says. "It's a real struggle — dealers are stocked and people are not spending money on boats."

On The BSTS Team. *Vinnie Christina (above) is the payload design project leader on the BSTS program.*

In Emergency Products, delivered orders are up 12 percent, inbound orders are up 10 percent, and the backlog is up more than 20 percent over last year. The exact number of vehicles is proprietary.

LLV

Under a $1.1 billion contract, Allied is building 99,150 Long Life Vehicles (LLV) for the U.S. Postal Service, and there is an option for 59,000 more. The 550 Grummanites working in Montgomery, Pennsylvania, are building the aluminum bodies, which are designed to last 24 years, and mating them to General Motors chassis. The first LLV was delivered in 1987.

Grumman will deliver 18,880 LLVs in 1989; 640 ahead of schedule. The LLV unit issued four quarterly performance awards as part of its gain-sharing program. Next year it expects to receive authorization for the next contract cycle.

The Pieces That Make Up The Company

Grumman Corporation

Chairman and President John O'Brien
Vice Chairman—Corporate Technology Renso Caporali
Vice Chairman—Finance and Treasurer Bob Freese

Business: Oversees six Grumman divisions and the Systems Group. Major departments are Corporate Audit, Corporate Manufacturing, Corporate Technology, Finance and Treasurer, Legal, Marketing, Mergers and Acquisitions, Product Integrity and Environmental Protection, Public Affairs, Secretary and Personnel, and Washington Operations; and the Corporate staff.

Location: Headquartered in Bethpage, L.I.

Major Subsidiaries: Grumman Credit Corp., Grumman Foreign Sales Corp., Grumman International Inc., Grumman Ventures Inc., Grumman World Enterprises Corp., Paumanock Development Corp. and Paumanock Insurance Co. Ltd.

Work Force: 286 people

Keeping The Books. *Dave Arnold, who is director of Accounting, is a member of the Controller's staff.*

Total Grumman Population: 28,979

Average Age: 43

Average Years of Service: 13

As of November 24, 1989

Allied

Len Rothenberg, president

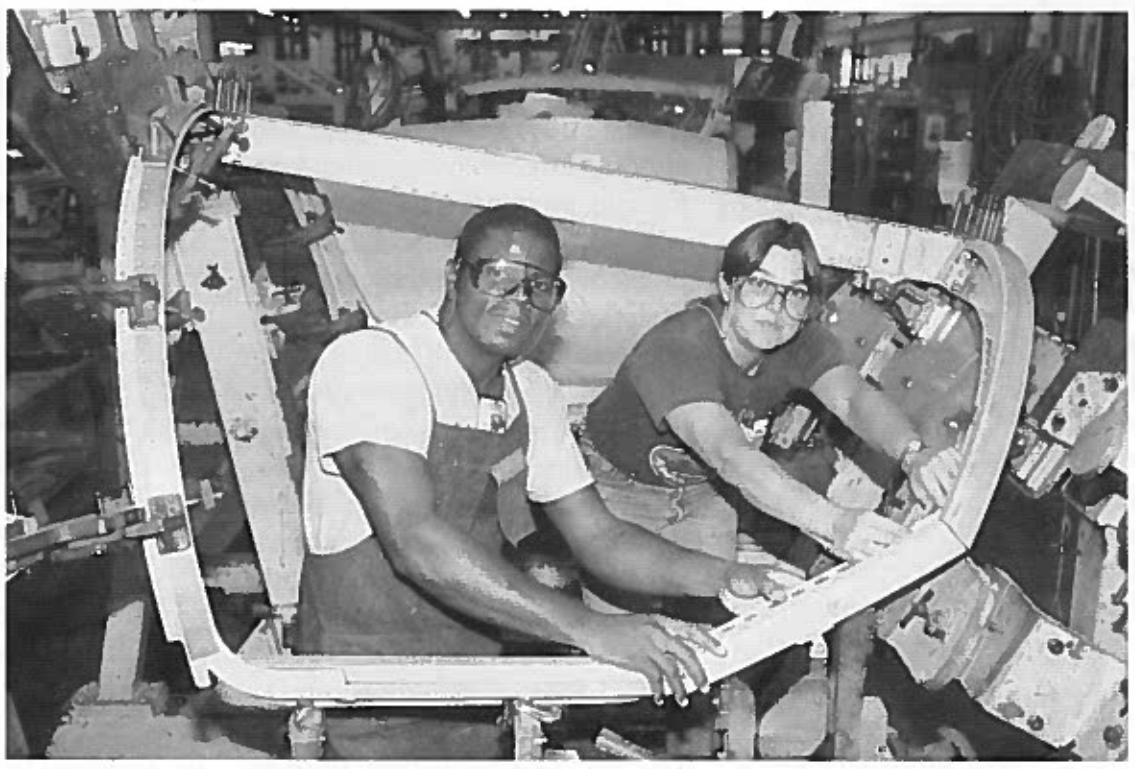
Business: Produces specialty vehicles and recreational marine products. Its four operating units are: Grumman Boats, Grumman Emergency Products (fire trucks), Grumman Olson (trucks), and LLV (the Long Life Vehicle).

Major Programs: LLVs for the Postal Service; Route Star, a walk-in delivery van introduced this year to replace the Kurbmaster; Tigercat, a new, lower-cost pumper model introduced by Emergency Products this year; and recreational boats and canoes.

Location: Headquartered in Bohemia, Long Island; with facilities in: Lexington, S.C. (fabrication center); Marathon, N.Y., Arkadelphia, Ark., and Minong, Wis. (Boats); Montgomery, Pa. (LLV); Roanoke and Vinton, Va. (Emergency Products); and Sturgis, Mich., Mayfield, Pa., Sherman, Texas, and Tulare, Calif., (Olson).

Work Force: 2,259 people

Side Job. *Clara Rutan makes parts for the gunnels – sides– of Grumman boats in Marathon, N.Y.*



Deep In The Heart Of Texas. *Willy Phillips and Denise Adams are at work in Houston on an EA-6B canopy.*

Aircraft Systems

Peter Oram, president

Business: Designs and manufactures military aircraft and integrates aircraft systems; modifies and overhauls Grumman and other contractors' aircraft; product improvement and remanufacture of existing aircraft; subcontractor in the design, development and manufacture of commercial aircraft assemblies and components. On January 17, 1989, Grumman announced the consolidation of three divisions; the Aerostructures and St. Augustine divisions became units of Aircraft Systems.

Major Programs: F-14A(PLUS), F-14D, A-6E, EA-6B, E-2C, C-2A for the Navy, F-8II Peace Pearl for the People's Republic of China, S-2T modernization for foreign sales, EF-111A kits for the Air Force, Boeing 757 and 767 major components, McDonnell Douglas C-17 control surfaces, nacelles and thrust reversers for Gulfstream and Fokker aircraft.

Location: Headquartered in Bethpage; with facilities in Melville and Calverton, L.I.; Glen Arm, Md.; Milledgeville, Ga.; Stuart and St. Augustine, Fla.; Houston, Texas; and Pt. Mugu, Calif.

Work Force: 15,584 people

Systems Group

Tom Guarino, president

The Systems Group comprises the Electronics, Melbourne, and Space Systems divisions and a group staff. The group has two missions. The first is to create a growing electronics systems business serving the Department of Defense and NASA. The second is to take advantage of past investments and current market and technology positions to win more business in specific electronics markets.

Location: Headquartered in Bethpage, L.I.

Work Force: 13 people

On Top Of Things. *Melbourne Systems' Bill Guttadauro is at work on the Joint STARS program, which is preparing for a demonstration to European military leaders in 1990.*

Melbourne Systems

Al Verderosa, president

Business: Prime contractor for the Joint Surveillance Target Attack Radar System (Joint STARS), a system being developed for the Air Force and the Army.

Location: Headquartered in Melbourne, Fla., with a site in Melville, L.I.

Work Force: 688 people

Ready For A Big Year. *George Clarius is a member of the IFTE team in Melville, L.I. The first deliveries of two IFTE components will take place in 1990.*

Electronics Systems

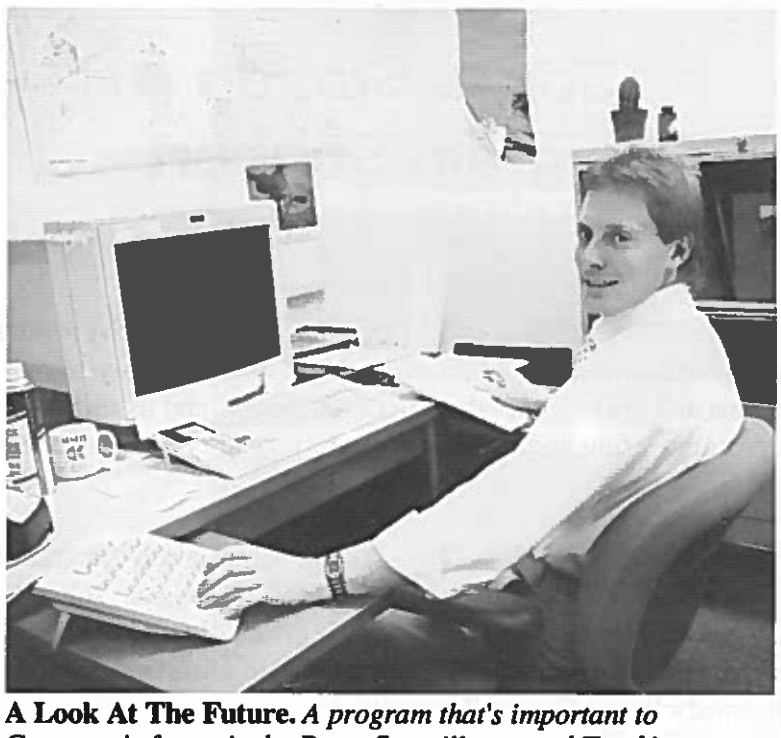
Bob Nafis, president

Business: Electronics-related manufacturing services for itself and other Grumman divisions, with contract manufacturing and build-to-print capabilities; develops fundamental technologies in advanced, specialized circuits, UHF radar modules and high-speed data buses, avionics and other specialized systems; automated test equipment; and aircrew, operator and electronic warfare trainers.

Major Program: Integrated Family of Test Equipment (IFTE) for the Army.

Location: Headquartered in Great River, L.I.; with facilities in Benton Park, Pa.; Bohemia, L.I.; Fishkill, N.Y.; Melville, L.I.; and Salisbury, Md.

Work Force: 2,303 people



A Look At The Future. *A program that's important to Grumman's future is the Boost Surveillance and Tracking System. Cliff Franklin is a member of the Bethpage team.*

Space Systems

John Harrison, president

Business: Designer and builder of space systems and vehicles and energy systems for civilian and military use.

Major Programs: Boost Surveillance and Tracking System for the Air Force, Continuous Wave Deuterium Demonstrator and Power System Demonstrator-Phase I for the Army, Ground Test Accelerator for the Los Alamos National Laboratory, Mutimegawatt Space Nuclear Power System and Superconducting Super Collider for the Department of Energy, Space Station Work Package Number 1 for NASA, and the DARPA-funded Synchrotron X-ray Light Source.

Location: Headquartered in Bethpage, L.I.; with facilities in Irvine, Calif.; Princeton, N.J.; Los Alamos, N.M.; and Houston, Texas; and smaller teams in Los Angeles, Calif., and Oak Ridge, Tenn.

Work Force: 579 people

Information, Please. *Scott Murphy sets up a robotic storage and retrieval system that can quickly get to data tapes needed by a computer system user somewhere in Grumman.*

Data Systems

Bob Myers, president

Business: Designs, develops, integrates, operates and supports computer systems for managing information, principally for federal agencies. Operates major business and scientific computer facilities and is the primary provider of telecommunications and computer services and resources for all Grumman divisions. Also provides technical training, automated publishing and third-party computer maintenance services.

Major Programs: ATACC for the Marines; HSRP and DMMIS for the Air Force; EADS and ECS for NASA; the Rapid Acquisition of Manufactured Parts program for the South Carolina Research Authority; and the New York State Welfare Management System.

Locations: Headquartered in Bethpage, Long Island; with facilities in Woodbury, Holtsville and Calverton, L.I.; Dayton, Ohio; McLean, Arlington and Springfield, Va.; Huntsville, Ala.; Houston, Texas; Charleston, S.C.; and San Diego, Calif.; and Systems Support offices nationwide.

Work Force: 2,627 people

Technical Services

Wiley Williams, president

Business: Provides technical and management services worldwide for space systems, aircraft systems and training systems, along with their related support systems.

Major Programs: Subcontractor to Lockheed on Shuttle Prrocessing Contract; maintenance of Army UH-1 helicopter simulator; Air Force System Trainer and Exercise Module logistics support; subcontractor to Aircraft Systems on Peace Pearl; Electron Beam Lithography program for IBM; Grumman products operational maintenance simulator support.

Location: Headquartered in Titusville, Fla. with 69 sites worldwide.

Work Force: 1,581 people

3-2-1. *Technical Services' Lydia Muniz helps prepare the Space Shuttles for launch at the Kennedy Space Center.*

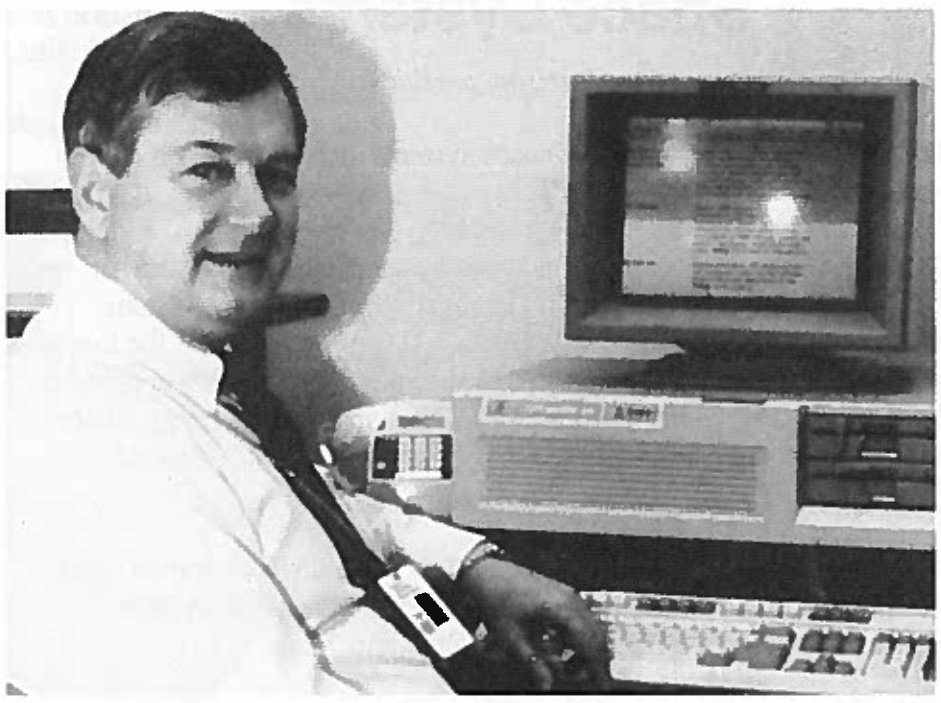
On Guard. *Fire Chief Jim Emken (L) and Evacuation officer Jack Burns look over a floor plan. Revised evacuation procedures were put in place at the Long Island sites in 1989.*

Corporate Services

Business: Provides commonly used services to other divisions and companies in Grumman Corporation. These include Business Operations, Corporate Procurement, Facilities, Food Services, Legal, Personnel and Administrative Services, Security, and Transportation.

Location: Headquartered in Bethpage, L.I.

Work Force: 2,653 people



On Station. *Fred Precht works in the Space Station Program Support Division's Reston, Va., headquarters. The division also has people in the major NASA space centers.*

Space Station Program Support

Fred Haise, president

Business: Role is to help NASA manage the design and development of the Space Station *Freedom*. Assists NASA in such areas as program control and management, information systems, operations and utilization, program requirements and assessment, systems engineering and integration, safety, quality assurance and international integration.

Location: Headquartered in Reston, Va.; with program integration offices at Marshall Space Flight Center, Huntsville, Ala.; Johnson Space Center, Houston, Texas; Goddard Space Flight Center, Greenbelt, Md.; Lewis Research Center, North Olmstead, Ohio; and Kennedy Space Center, Titusville, Fla.

Work Force: 406 people

Financial Highlights And Delivery Schedules

	Sept. 30, 1989	Sept. 30, 1988
Net Sales	$2,692,210,000	$2,613,206,000
Net Income	$ 52,501,000	$ 62,332,000

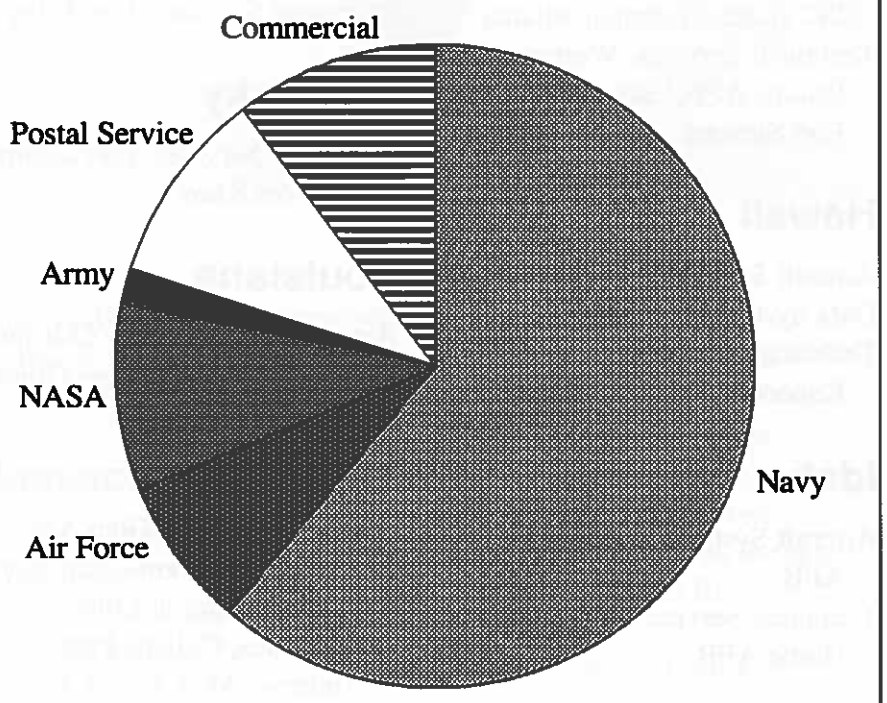
Backlog

As Of Sept. 30,

1989: $6.9 Billion

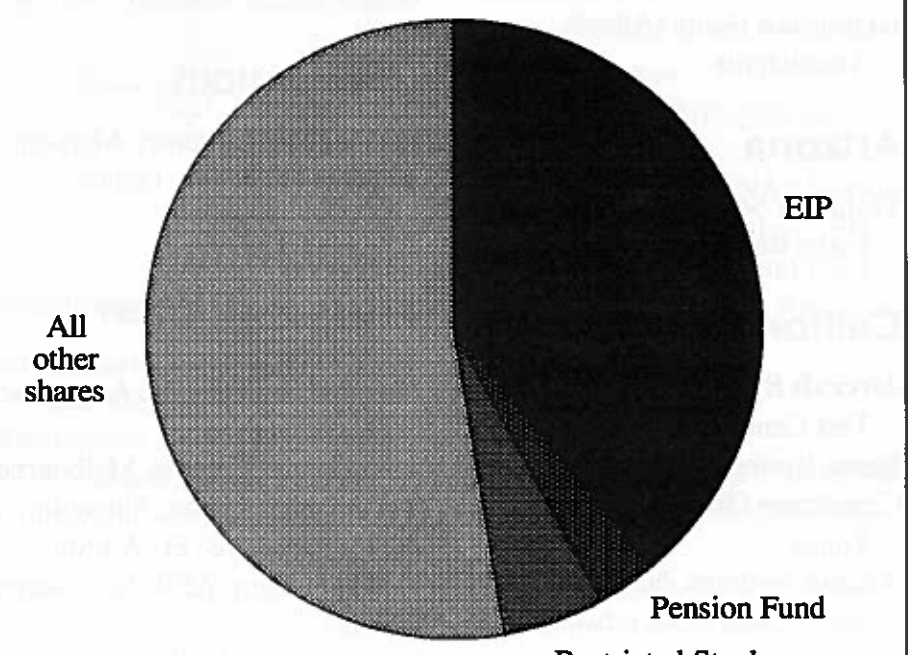
1988: $7.9 Billion

Backlog By Customer



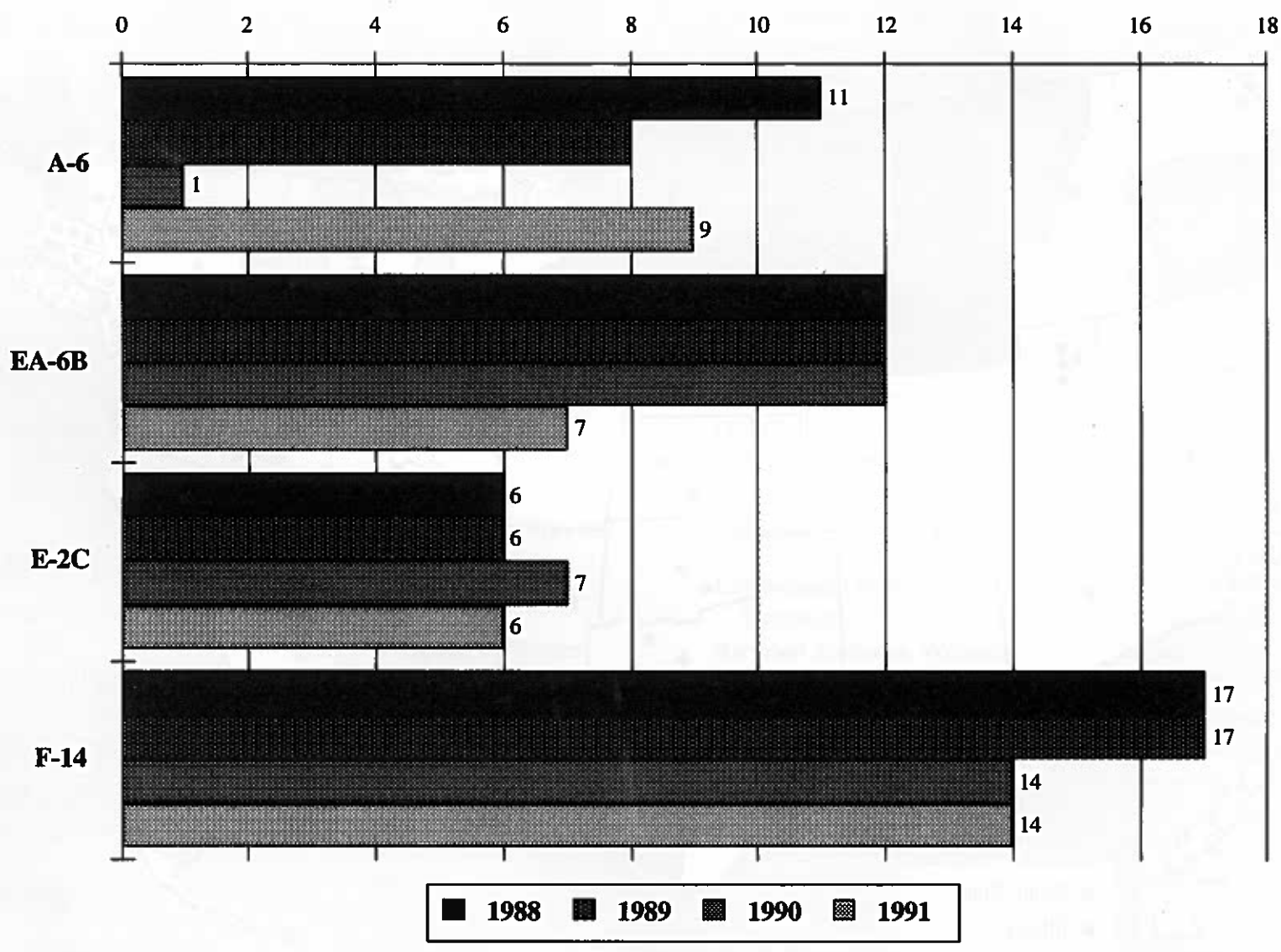
As of June 30, 1989

Who Owns Grumman Stock



As of September 30, 1989

Aircraft Schedules 1988-1991



As of December 8, 1989

Grumman: From Sea To Shining Sea

Major sites in bold

Alabama

Space Station Support, Huntsville
Data Systems, Huntsville
Electronics Systems, Huntsville
Grumman Systems Support Corp. (GSSC), Data Systems, Birmingham
Technical Services, Dothan and Fort Rucker

Arkansas

Grumman Boats (Allied), Arkadelphia

Arizona

Technical Services, Luke Air Force Base

California

Aircraft Systems, Pacific Missile Test Center at Pt. Mugu
Space Systems, Irvine
Grumman Olson (Allied), Tulare
Aircraft Systems, Naval Air Station Alameda, Edwards AFB, NAS North Island, Marine Corps Air Station at El Toro, Naval Weapons Center at China Lake, and NAS Miramar
Data Systems, San Diego
Space Systems, Los Angeles
Technical Services, NAS Alameda, NWC at China Lake, Edwards AFB, MCAS El Toro, NAS Lemoore, NAS Miramar, NAS North Island, PMTC Pt. Mugu, Sacramento, Fort Ord, McClellan AFB
GSSC (Data Systems), Anaheim, Concord, Los Angeles, Sacramento, and San Diego

Colorado

Data Systems, Colorado Springs

Connecticut

GSSC (Data Systems), Meriden
Technical Services, Orange

Florida

Aircraft Systems, Stuart Operations
Aircraft Systems, St. Augustine Operations
Melbourne Systems, Melbourne
Technical Services, Titusville
Aircraft Systems, Ft. Walton Beach, Eglin AFB, NAS Key West
Data Systems, Melbourne
Space Station Support, NASA/ KSC
GSSC (Data Systems), Kennedy Space Center and Melbourne
Technical Services, Duke Field, Eglin AFB, Homestead AFB, Hurlburt Field, Kennedy Space Center, Key West, NAS Pensacola, NAS Cecil Field, and NS Mayport, Jacksonville

Georgia

Aircraft Systems, Milledgeville Operations
Aircraft Systems, Warner Robins AFB
Data Systems, Albany
GSSC (Data Systems), Atlanta
Technical Services, Warner Robins AFB, Savannah ANG, Fort Stewart

Hawaii

Aircraft Systems, Honolulu
Data Systems, Honolulu
Technical Services, Fort Shafter, Kaneoha

Idaho

Aircraft Systems, Mountain Home AFB
Technical Services, Mountain Home AFB

Illinois

GSSC (Data Systems), Des Plaines and Schaumburg

Indiana

Aircraft Systems, Naval Weapons Support Center, Crane
Technical Services, NWTC, Crane

Kansas

Melbourne Systems at Boeing Military Airplane Company, Wichita
GSSC (Data Systems), Kansas City
Technical Services, Fort Riley

Kentucky

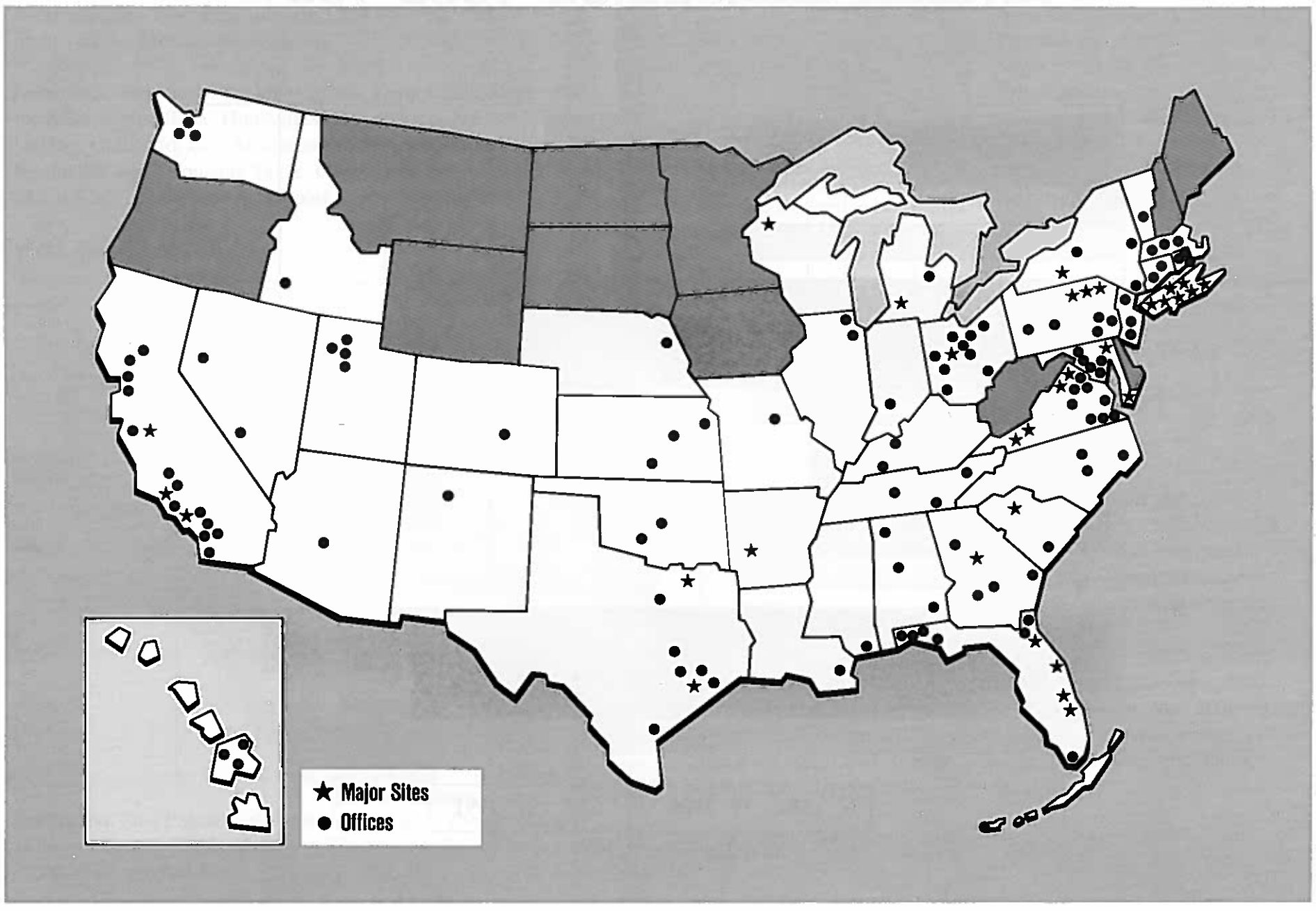
Technical Services, Fort Campbell and Fort Knox

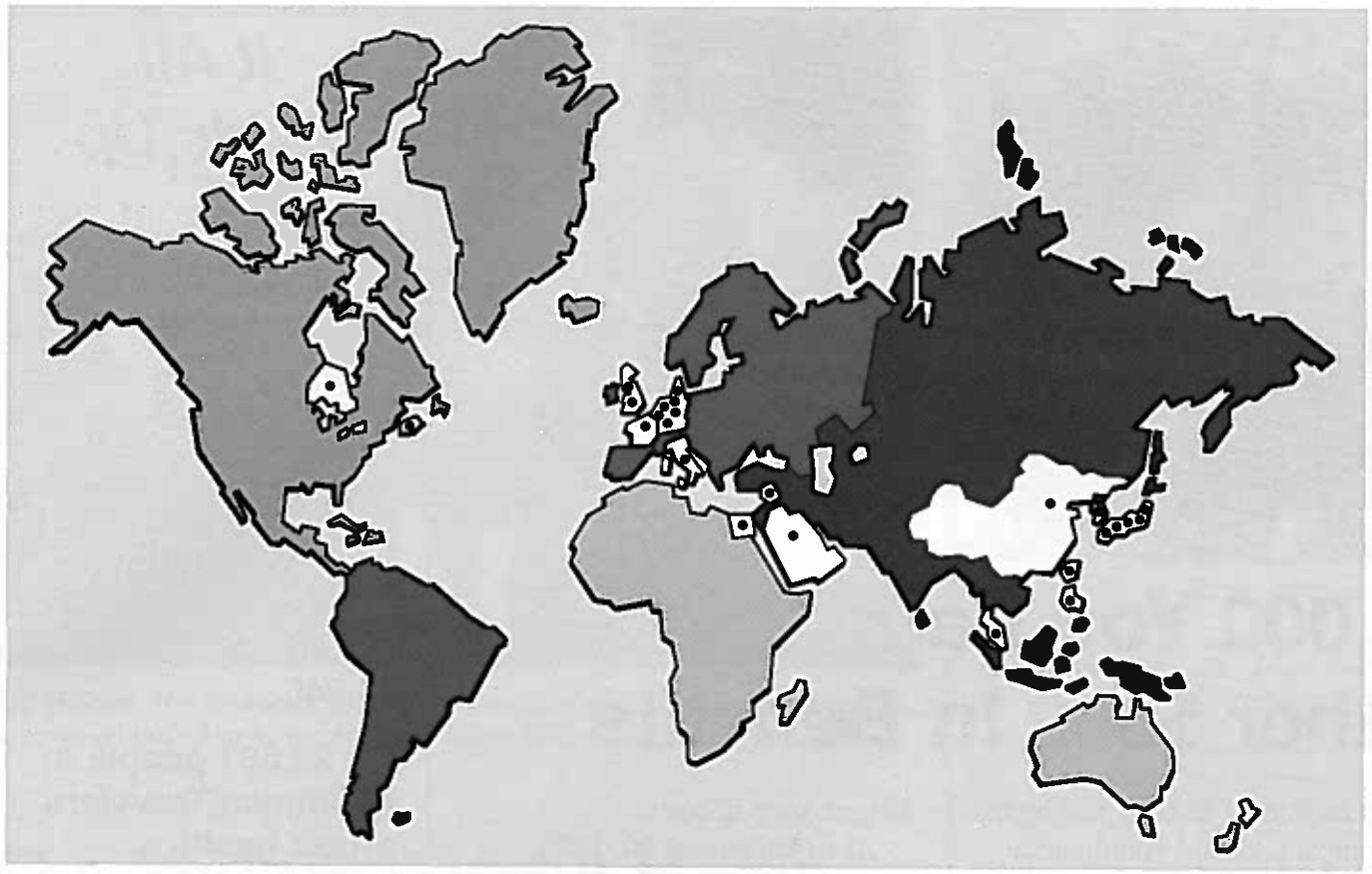
Louisiana

Aircraft Systems, New Orleans
Technical Services, New Orleans

Maryland

Aircraft Systems, Glen Arm
Electronics Systems, Salisbury
Aircraft Systems at Litton Industries, College Park, Andrews AFB, Naval Air Test Center, Patuxent River
GSSC (Data Systems), Gaithersburg





Space Station Support, Greenbelt
Technical Services, Naval Air Test Center, Patuxent River

Massachusetts

Grumman Olson (Allied), Lexington
GSSC (Data Systems), Woburn
Technical Services, Worcester

Michigan

Grumman Olson (Allied), Sturgis
GSSC (Data Systems), Troy

Mississippi

Technical Services, Keesler AFB

Missouri

GSSC (Data Systems), Maryland Heights

Nebraska

GSSC (Data Systems), Omaha

Nevada

Aircraft Systems, Nellis AFB
Technical Services, Fallon AFB, Nellis AFB

New Jersey

GSSC (Data Systems), Fairfield, Cherry Hill
Space Systems, Princeton

New Mexico

Space Systems, Los Alamos National Laboratory

New York

Grumman Corp., Bethpage
Aircraft Systems, Bethpage, Calverton, and Melville
Allied, Bohemia
Grumman Boats (Allied), Marathon
Data Systems, Bethpage, Calverton, Holtsville, Woodbury, New York City
Electronics Systems, Bethpage, Bohemia, Great River, and Melville
Space Systems, Bethpage
Grumman International, Bethpage
Grumman Olson (Allied), Jericho
Melbourne Systems, Melville
InfoConversion (Data Systems), Woodbury
Data Systems Institute, Woodbury and Bohemia
Technical Services, Bethpage and Fishkill
GSSC (Data Systems), Albany, Bethpage, Latham, New York City, Syracuse, Woodbury

North Carolina

Aircraft Systems, MCAS Cherry Point
Technical Services, MCAS Cherry Point and Fort Bragg
GSSC (Data Systems), Fayetteville and Raleigh

Oklahoma

Technical Services, Fort Sill

Ohio

Data Systems, Fairborn
Data Systems, Newark
Space Station Support, Cleveland
GSSC (Data Systems), Bowling Green, Brookville, Cincinnati, Springboro, and Strongsville
Grumman Ohio Corp., Worthington
Grumman Olson (Allied), New Albany

Pennsylvania

Grumman Olson (Allied), Mayfield
Electronics Systems, Benton Park
LLV (Allied), Montgomery
Grumman Olson (Allied), Jenkintown
GSSC (Data Systems), Monroeville and Norristown
Aircraft Systems, Aviation Supply Office, Philadelphia
Technical Services, Aviation Supply Office, Philadelphia and Fort Indiantown Gap

Rhode Island

GSSC (Data Systems), East Providence and Rumford
Technical Services, Smithfield

South Carolina

Grumman Allied, Lexington
Data Systems, North Charleston

Tennessee

Space Systems, Oak Ridge National Laboratory
GSSC (Data Systems), Chattanooga

Texas

Grumman Olson (Allied), Sherman
Aircraft Systems, Webster
Aircraft Systems, NAS Dallas
Data Systems, Johnson Space Center, Houston
Space Systems, Houston
Space Station Support, Houston
Technical Services, Corpus Christi, NAS Dallas, Johnson Space Center-Houston, and Fort Hood
GSSC (Data Systems), Houston, Dallas and Austin

Utah

Data Systems, Ogden and Layton
Technical Services, Hill AFB
GSSC (Data Systems), Salt Lake City

Vermont

GSSC (Data Systems), White River Junction

Virginia/Wash., D.C.

Space Station Support, Reston
Data Systems, McLean
Emergency Products (Allied), Roanoke and Vinton
Grumman Corp., Arlington
Aircraft Systems, NAS Norfolk, NAS Oceana
Data Systems, Arlington and Springfield
Technical Services, NAS Norfolk, NAS Oceana, Langley AFB, Fort Belvoir, and Dam Deck
GSSC (Data Systems), Richmond

Washington

GSSC (Data Systems), Redmond
Aircraft Systems, NAS Whidbey Island
Technical Services, NAS Whidbey Island and Fort Lewis

Wisconsin

Grumman Boats (Allied), Minong

International

Corporate Regional Office: Canada, Enfield, Nova Scotia
Grumman Olson (Allied), Canada: Oshawa, Ontario
Grumman International (GII): Paris, France; Singapore; Taipei, Taiwan
Data Systems, Singapore
Also, Grummanites in Technical Services and Aircraft Systems work at the following locations:
Cairo, Egypt
RAF Upper Heyford, England
RAF Alconbury, England
Bad Munder, West Germany
Basdahl, West Germany
Ramstein, West Germany
Hanau, West Germany
Preum, West Germany
Sigonella, Italy
Atsugi, Japan
Iwakuni, Japan
Misawa Air Base, Japan
Yokosuka, Japan
Seoul, Korea
Suwon, Korea
Cubi Point, Philippines
Saudi Arabia (27 sites thoughout)
Singapore

Bread And Butter. *Robert Gayton (L) makes A-6 parts for Aircraft Systems in Houston, Texas; while Nick Dix, (above) is manager of Program Planning and Control for DMMIS, in Fairborn, Ohio.*

For Every $1,000 You Earn, You Get Another $342 In Benefits

During 1988, the Grumman payroll topped $1.2 billion. Over $388 million went to help pay for the fringe benefits such as medical insurance, pension coverage and the Employee Investment Plan. On average, for every $1,000 earned an additional $342 is paid by the company toward your benefits. The figures for 1989 were not available when *Grumman World* went to press.

During 1988, mandatory benefit costs, such as Social Security, workmen's compensation and unemployment insurance, reached $97.4 million — an increase of about $9 million over 1987. Grumman contributed $16.1 million for the Employee Investment Plan's company match. Over $146 million went for vacations, holidays, paid absences and severance pay. Another $5.7 million was absorbed by miscellaneous costs that included holiday turkeys, scholarship funds, travel insurance and special medical expenses.

Group health insurance costs increased 18 percent during 1988 to over $117 million dollars. That was $17 million more than the previous year, representing the largest jump in costs.

As of September 30, 1989, 22,454 Grummanites belonged to the Grumman Pension Plan. During 1988, pension benefits totaling $70 million were paid to retirees and surviving spouses. As of October 31, 1989, plan assets were $2.1 billion. More than 1,100 Grumman people joined the retiree ranks in 1989, while another 1,100 became vested in the pension plan.

Grumman Allied has its own plan with about 1,800 participants. Aircraft Systems' St. Augustine Operations in Florida, Grumman Technical Services Division, and Electronics Systems' Salisbury Operations in Maryland have capital accumulation plans with almost 3,000 participants.

Other groups have profit-sharing plans or other plans as appropriate, and the company contributes towards the accounts in either a lump sum or in installments.

Pension Plan

Members
22,454
As of September 30, 1989

New Retirees
1,171
As of September 30, 1989

Pensioners
(including spouses)
11,963
As of September 30, 1989

Age of Retirees
including spouses)
Less than age 61—831
Age 61-65—2,131
Age 66-75—6,128
Age 76-85—1,725
Over age 85—188
As of January 1, 1989

Average Number Of Checks Received*
Male—196
Female—259
****Estimated on basis of age 62 retirement***

Oldest Pensioner
George Haegele, 97
Checks Received—336

It All Adds Up

As of October 31, 1989

• 3,222 Patient Advocate calls

• Number of prescriptions filled with mail order program:
Active employees: 32,114
Retirees: 41,846

• 23,581 people in Grumman/Travelers group health insurance program, plus 41,700 dependents

• 5,465 people belong to HMOs, plus 10,000 dependents

• Health claims averaged 27,222 per month in 1989

• 12,746 people purchased vacation time

• Number of people using flexible spending accounts:
Health: 2,946
Dependent Care: 181
Legal: 2,550

Quinn's Retired, But He's Not Leaving Town

After 32 years as a Grumman industrial engineer, Ed Quinn retired this past September, but he doesn't feel like a retiree yet.

"For one thing, I'm not heading south," says Quinn. "My wife and I will be staying here in Centereach on Long Island, at least for the time being. Barbara's a teacher and has three years to go before retiring. Plus our six children all live in the area, so I don't think that we'd be happy anywhere else.

"I've treated myself to a three-month vacation," he adds. "I used to be up at six every weekday. Now I can take my time. Sometimes I'm still in bed at 7:30, and I watch a little TV before I get moving."

After the holidays, Quinn plans to get back to his woodworking. He describes himself as "unskilled but persistent" at the craft.

Fortunately, finances are not a problem for the Quinns. "Between Social Security and my pension, we're in pretty good shape," he says. "I've been able to leave my Employee Investment Plan money intact, so that it can continue to grow. It's comforting to know that the money's there for when it's needed. I've still got a couple of weddings to pay for."

Family Man. *Ed Quinn retired in September, but he and wife Barbara will be staying in Centereach, New York, to remain near the rest of their family.*

EIP Helped. *The Grumman EIP helped Paul and Lori Young with the down payment on their first home. At left are daughters Alicia, 4, and Jillian 1.*

The Youngs Find A Home With A Little Help From EIP

This past August, Paul and Lori Young found just the house that they were looking for.

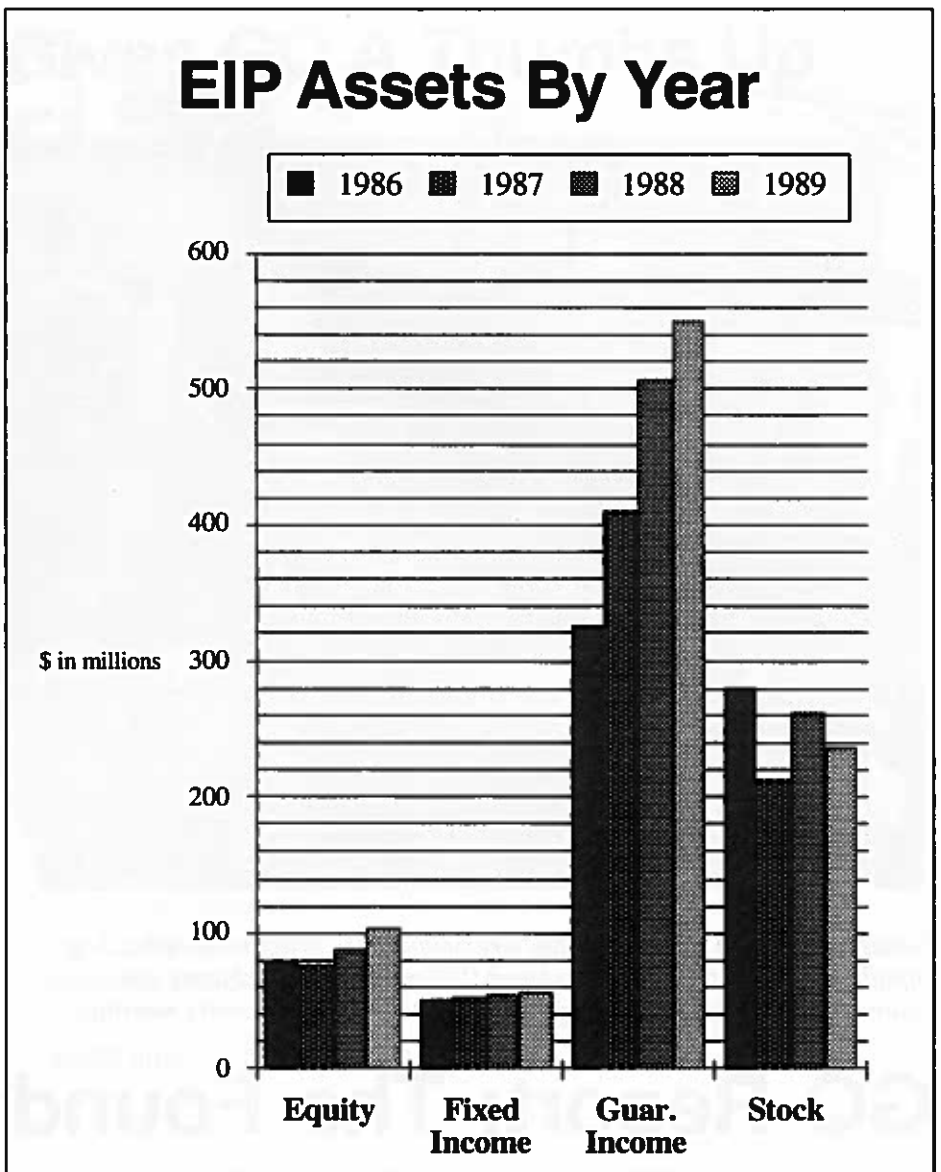
"We were able to shop a bit sooner than we'd expected due to an inheritance," says Paul, a data security analyst for Data Systems in Bethpage. "Luckily, it was a buyer's market here on Long Island, so we didn't have to rush into a purchase."

Over a period of six months, they looked at at least 25 homes in Nassau and Suffolk before they found one in the town of Farmingdale that met all their needs. The Youngs have two young daughters.

"The house was perfect for us," says Paul. "It's in good condition, in a good school district, near relatives and Grumman, and we could afford it."

In addition to the inheritance, Paul used money from the Employee Investment Plan (EIP) to help with the down payment.

"One of the reasons that I joined EIP as soon as I came to Grumman was to save for a down payment. Once we budgeted for the deduction, saving was painless," says Paul. "Even though we were able to purchase much sooner than we'd planned, the EIP money still meant a lot to us at our closing."



EIP Nears 25,000 Mark

Membership in the Employee Investment Plan totaled 24,613 as of September 30, 1989. Grummanites accounted for 19,900 members and retirees 4,713.

Info Phone

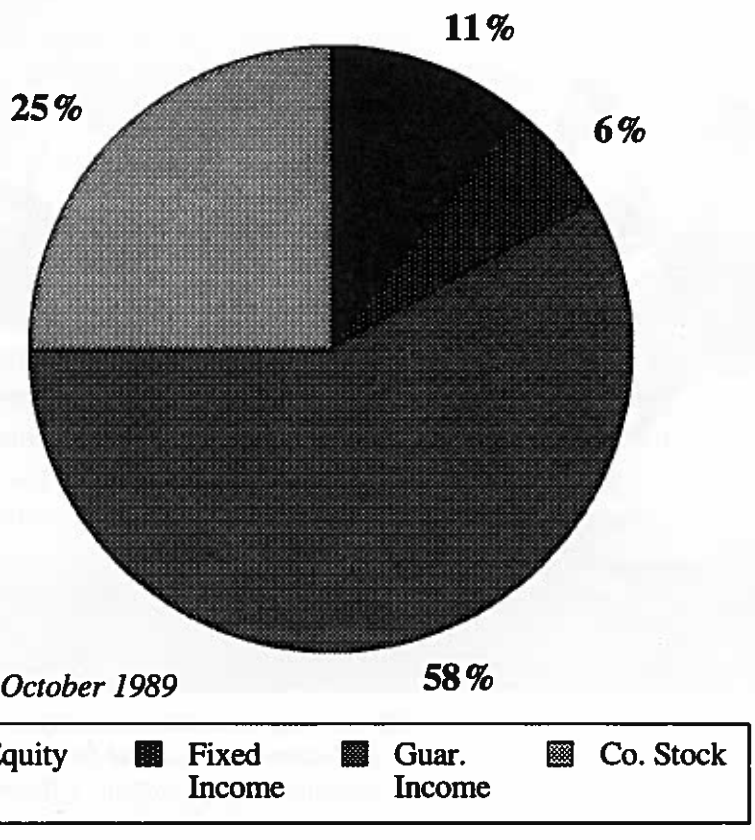
A phone call will bring you the latest unit values from the Employee Investment Plan office in Headquarters. Also featured is any late breaking news. Call (516) 575-4400 for the recording.

How Medical Helped Us Stay Healthy In 1989

- Twelve medical seminars were conducted on subjects ranging from Lyme disease to the effects of alcoholism on the family. Workshops were held on nutrition and body fat analysis.
- Over 3,000 Grummanites, retirees and their spouses had their cholesterol checked.
- Four sessions were held in the CPR-Heartsaver program. Over 160 Grummanites were certified or recertified to perform cardiopulmonary resuscitation.
- Health fairs were held at sites on Long Island, Houston, Sturgis and Milledgeville during the year.
- Glucose testing for diabetes is now available at many Grumman sites.
- During hypertension month in May over 1,200 people were screened for high blood pressure, and many others were tested throughout 1989.
- Approximately 250 women received mammographies.
- 400 apples were distributed on National Smokeout Day to Grummanites trying to quit. Tips on quitting were also offered during a seminar.

Percent Invested in EIP Funds

Total Assets: $951 Million*



**as of October 1989*

Grumman Quality Takes Wing. *Grumman's GQ program is spreading rapidly throughout the company, and 1990 will be a blockbuster year for training. The latest achievements are reported at GQ quarterly meetings, such as the one that was held at the Cradle of Aviation Museum in Mitchel Field, Long Island. At these meetings, representatives from several action teams report on their groups' accomplishments.*

GQ Report: The Foundation Has Been Poured, We're Ready To Start Building The House

"We've come a long way with GQ in the past 16 months; we poured the foundation for the future," says Dean Cassell, Grumman vice president—Product Integrity and Environmental Protection and chairman of the Corporate Quality Council. "Next year, we will start to build the house."

GQ Means Grumman Quality

So much has happened about the Grumman Quality process (GQ) since Chairman John O'Brien announced the process in June 1988. One hundred and twenty facilitators have been trained, 180 action teams are wrestling with problems in every division in the company and, already, 50 solutions have been put into place affecting many segments of the company.

Because of GQ, the Long Life Vehicles are built better. GQ has speeded the analysis of subcontractors' bids.

GQ is a hit. *Aircraft Systems' GQ steering committee recently met with Grummanites in Houston, Texas, Milledgeville, Ga., and Stuart, Fla., to underscore the importance of the program to the company's future. The committee learned here in Stuart, as they did in the other two sites, that GQ is being taken to heart.*

Grummanites in Data Systems wait less to hire people they need and people in Aircraft Systems have report-writing guidelines that eliminate hundreds of pages of unread, unnecessary information.

According to Cassell, the company has received an estimated 150 percent return on its investment.

Return on investment is not the only reason that Grumman started GQ. As Cassell says to just about every GQ group that he addresses, "We must change our culture. We must change the way we approach our jobs each day. Nothing we do in this company will ever be perfect, but if we don't keep making the processes we use better, this company will not grow."

GQ gives Grummanites the tools to change the culture of their company. But there is still a way to go before all Grummanites have the tools in their hands.

To date, about 7,500 Grummanites have been trained during either the one- or two-day session. In 1990 the training accelerates. "1990 will be a training year that will knock your socks off," Cassell says.

Where Grummanites have been trained, the cultural change is readily seen, Cassell says. "People are starting to talk a new language, like doing 'right things right' and 'customer alignment,'" he says. "We've learned that if we follow the process, good things will happen."

Cassell admits that there are still skeptics at all levels who haven't been convinced that GQ is effective. He points to the success other companies have had with the same or similar total quality processes.

Japanese companies have become the standards by which other nations' businesses measure themselves. Japanese companies did it by totally immersing all their employees in an environment where constant improvement is as regular as lunch.

But there are examples closer to home.

Cassell points out that Xerox is the only company to have regained market share from its Japanese competitors. Xerox did it with a policy of continuous improvement similar to GQ. The copier manufacturer constantly evaluates its own processes against those of competitors and other companies. Cassell says that Xerox adopted the order processing system of L.L. Bean, the mail order house, to improve its own operation.

There are other success stories, too: Motorola, Federal Express, the Norfolk Naval Shipyard.

Generally, these companies and organizations met obstacles as they started their own versions of GQ. "Companies that are successful say quality is a journey, never a destination," Cassell says.

After sharing experiences with

other companies, Cassell believes that Grumman's record is better than average at this stage in the program's life. "We've talked to at least three dozen other companies. They are amazed at what we've been able to do in just 16 months," he says.

Several of the Grumman divisions have become real success stories.

"At LLV, GQ is the way they approach work every day. Data Systems' enthusiasm for GQ is amazing.

"But we still have a long way to go before we have this thing running throughout the company," Cassell says. "The very size of Aircraft Systems dictates that it will take a while to get GQ into its entire organization. 1990 will be the 'year of implementation' in Aircraft Systems. Twelve thousand Grummanites will be trained and become involved in process improvements."

The people in Technical Services quickly adopted GQ. Grummanites on its Shuttle Processing Contract achieved such a high level of quality that the division was named one of the finalists for NASA's prestigious Quality Award. "That's like making the final four in the NCAA basketball championships," Cassell says.

The real hurdles are ahead in 1990, as GQ goes beyond being a problem-solving tool to a planning tool and a decision-making tool.

"One lesson that's been learned in the 16 months since GQ started," Cassell says, "is that everybody has to be a player. Quality is not a spectator sport."

Sign Of The Times. *At one of GQ's quarterly meetings, Terry Morse reported on how her Data Systems action team reduced the expense and time in buying office supplies.*

Navy Flier Gives GQ A Thumbs Up

"I've seen Grumman people become very interested in meeting their customers' needs, understanding what the customers want, and trying to make those expectations happen," says Capt. Jim Aldrich, head of the Naval Plant Representative Office (NAVPRO) at Grumman.

He attributes that attitude to Grumman Quality (GQ). He went through Grumman's Quality Advantage training program earlier this year with other members of his staff. He is also well schooled in the Navy's version of GQ, called Total Quality Management. In fact, NAVPRO members are now being trained in that process; teams have started addressing some process problems.

He says that NAVPRO and Grumman people can work together to make tremendous improvements. "They know where the problems are," says the former F-14 pilot. "They know where our systems aren't working right.

"Right now there is a very good relationship between Grumman and the NAVPRO at all levels," he says. "We're poised to do some good things. But it's going to take everyone's commitment to make things happen."

His Kind Of Plane. *Capt Jim Aldrich, who recently took over as skipper of the Naval Plant Representative Office in Bethpage, has been flying Tomcats since the early '70s.*

GQ Has Already Made Its Mark

GQ action teams have improved processes in every division, and GQ has only been going since June 1988. Here is a list of some of those solutions:

Aircraft Systems

• Fifteen million pages of documentation and reports were eliminated in various departments and programs.

• By establishing drawing rules, developing a single parts list and generic modification kit milestones, the modification kit process was improved.

• Task teaming increased the efficiency and reduced the flow time of work statements.

• A planning and scheduling method, developed specifically for new program starts in Aerostructures, increased efficiency and clarified responsibilities.

• An awareness program and special handling instructions for verification and traceability tags in St. Augustine cut costs.

Allied

• By updating methods sheets, establishing self-inspection processes, standards, and a tracking system, rework and production time on the LLV program were reduced.

• The development of a work order/job costing system improved order entry.

Corporate Technology

• The effectiveness of the pre- and post-Opportunity Review Board process was improved.

Data Systems

• By establishing a consolidated Help Desk for system users, customers will get prompt responses to their questions and problems, reducing frustration and improving productivity. The Help Desk will start up in January 1990.

• A change in the budget preparation process means budget reports reflect authorized work within 30 days.

Electronics Systems

• Computer costs for the production status/reporting system were cut by reducing output media and distribution, and eliminating the running and printing of completed efforts.

• By getting manufacturing to concur with engineering orders before release, costs are avoided.

Melbourne Systems

• A single contact was established in each department to process requisitions and the number of sign-offs were cut, making the procurement process more efficient.

Services

• Cost and technical analyses are being done faster and less expensively because the need to inspect subcontractors' facilities was reduced.

• Corporate Procurement reduced the internal flow time in the procurement approval cycle.

• Business Operations improved the content and distribution of their products to insure consistent application.

Space Systems

• The proposal process was improved with task teaming, training and new guidelines.

Technical Services

• The role and mission of two operating units – Field Engineering and Support Services — were defined in terms of the new business they would pursue. This makes for a more focused marketing effort, clarifies the customer's image of the units and increases efficiency.

Grummanites Give Their Best To Their Internal Customers

Training in the Grumman Quality process began en masse in 1989.

Some of the smaller divisions have now trained most of their people. The Technical Services Division has trained about three-fourths of its 1,100 people. Meanwhile, the much larger Aircraft Systems Division launched an ambitious program in August, training 700 people per month. By the end of 1990, almost every Grummanite will have been trained in "The Quality Advantage," the introductory GQ course.

The result of one's labors is a product or service to the next person down the line, another department, or perhaps another division. The Grumman Quality process aims to improve what's delivered to that internal customer. The result: less waste of material and effort, trimmed costs, and ultimately, a more competitive product for the outside customer.

Practically Perfect. *Rod Neufer, Carl Miller, and Terry Strouse work in the final assembly department at Grumman's Montgomery, Pennsylvania, facility.*

Fine Print

In some corners of Grumman, practically everybody has now completed "The Quality Advantage." Administrative Services, part of the Corporate Services Division, is one of those groups.

The course teaches Grummanites the meaning of quality, the cost of not delivering quality, and the significance of customer-supplier relationships. In addition to participating in problem-solving quality action teams, people are encouraged to apply the GQ formula to their daily work routine.

"The GQ course was very helpful," says Tim Hardy, an offset press operator for Reprographics in Bethpage's Building 15. "We all give our 100 percent to the department. But we need to make some changes in our work systems. GQ will provide a way to do that."

A print shop has to deliver both quality and on-time performance. One problem the department plans to tackle: timing of jobs. "It's not a constant problem, but at times, the work can really back up," says Hardy.

The timing of work can result in another problem, says Hardy: he sometimes has to stop working on the offset press to operate another machine for several hours. "You might fall 10,000 to 15,000 impressions behind on that particular day," says Hardy. "That's a lot of time."

GQ may be having an impact in one other respect, says Hardy: people who submit work orders are less apt to fudge the dates — or to rush work that isn't imperative. "We see fewer people who want work right away, then don't come down to pick it up for two weeks," says Hardy. "We can use that time getting out a more important job."

Hot Off The Presses. *Tim Hardy expects GQ to help in his work as an offset press operator for Reprographics in Bethpage's Building 15.*

Trimming Paperwork

"Streamlining the Standard Practice Instructions will save everybody time — not to mention all the trees used for the paper they're printed on," says Jackie Goris, an operations planner in Integrated Ground Operations at Kennedy Space Center in Florida.

SPIs are documents issued by Lockheed, the prime contractor at the Cape for the Shuttle Processing Contract. SPIs instruct people on how to perform the tasks covered by the contract. Grumman's managers and supervisors determine who must get which SPIs. Goris coordinates a Grumman Quality action team working to cut wasteful distribution of these documents.

"SPIs have to be updated and reviewed periodically," says Goris. "The problem is, they are issued in volumes. Even if you need just one SPI in a volume, you receive the whole book. Plus, you receive any future updates."

Goris' team also includes people from Logistics, Engineering, Operations Maintenance Documentation, Central Data Systems, Operations, and the Tape Certification Laboratory.

The team is now in the fact-finding stage: collecting information to properly analyze the problem. It has issued surveys to the 45 SPI volume holders, asking them which parts of which volumes they need — and which they don't.

"We have some ideas on how to change the distribution process, but we must finish our research before deciding which way to go," she says. "That way, we will be better equipped to get people to adopt our solution."

Out Of The In Box. *Jackie Goris coordinates a GQ team that's trying to cut unnecessary documents at the Kennedy Space Center in Florida.*

Goris says that GQ's emphasis on the internal customer is helpful, since the Grumman team at Kennedy Space Center is a service organization. "In a small business, you can immediately see when the customer isn't satisfied," says Goris. "When your product is service, it's hard to measure your customer's reaction to it. GQ puts it in focus."

Special Delivery

Grumman Quality has greatly improved both workmanship and morale at the Long Life Vehicle facility in Montgomery, Pennsylvania — and that has made everybody's job easier.

At the beginning of this year, the facility put a productivity improvement bonus program into place. Each quarter, half the dollar gain from improved performance is shared with the 550 Grummanites who work in Montgomery. And so far, the bonus checks have gotten bigger each quarter.

Communication is just as important. The plant is divided into 42 work areas, each with a team leader. Every week, they all receive a half-dozen reports and charts to post on bulletin boards. These depict each group's performance in efficiency, scheduling, scrap, safety, and quality.

The improvement is quite evident on the plant's final assembly line.

"Since people are now doing self-inspection of their work, 99 percent of the rework is now caught in the areas where it originates," says Carl Miller, the foreman in the final line.

It's usually more expensive to fix something at the end of the line than to catch a mistake earlier. Some common examples: mail trays with sharp edges, and loose bolts. In addition, faulty parts could be inside an assembly. It would have to be dismantled, then reassembled.

"Here in final assembly, we used to see more problems," says Terry Strouse, a pre-delivery mechanic. "Everyone here is now aware that his or her contribution means something."

The LLV crew now takes 37 hours to build each truck, with less than two hours of rework. That compares to 45.5 hours and four hours rework at the same time last year.

Grumman People Hit The Books This Year

One of the ways that Grummanites improve their job skills is by taking advantage of the many education and training opportunities available to them. Thousands did so in 1989.

A total of 157 classes were offered by the Product Training Department in skills training to improve job performance in various manufacturing processes; 1,239 Grummanites spent a total of 6,230 hours participating in these classes. In addition, systems training in areas such as F-14A(PLUS) and F-14D avionics was given in 153 classes during which 679 Grummanites learned for a total of 9,868 hours.

Courses in Foreign Object Debris/Damage (FOD) were provided at all operations centers. Some 250 classes were given to approximately 5,000 Grummanites during the year.

The Corporate Education and Training Department helps Grummanites improve their job skills in areas such as management development, office automation, and ethics training.

During the year, some 3,513 Grummanites participated in these courses. The company provided $1,865,242 in tuition reimbursement for those who received qualified outside training.

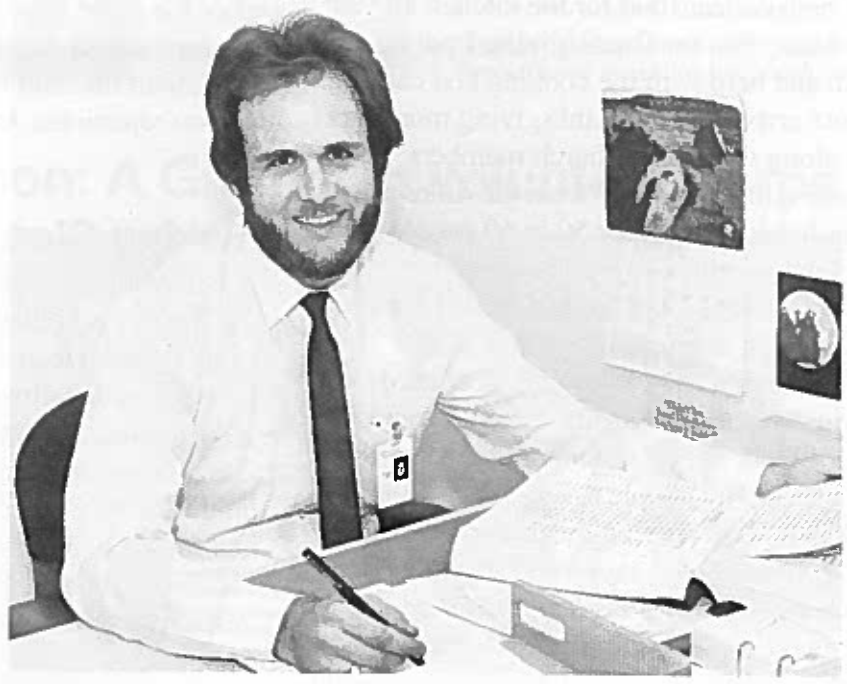
Twelve Master Fellow Grummanites graduated during 1989 and nine new students began the two-year program.

Ongoing Training. *Senior training specialist Bill Cooke teaches a class in F-14D electronic systems at Calverton Operations on Long Island. The Product Training Department provides ongoing skills and systems training.*

GDSI Offers Career Training To All

Grumman Data Systems Institute provides career training in areas such as computer programming and operations, computer-aided design, electronics and office automation. It is federally accredited and many courses qualify for tuition reimbursement. The institute recently added seminars in microcomputer software for both the business community and the general public.

Working For Students. *Manager of Training Ron Cohen and career counselor Sue Rothman help GDSI students get the right training and help finding a job upon graduation.*



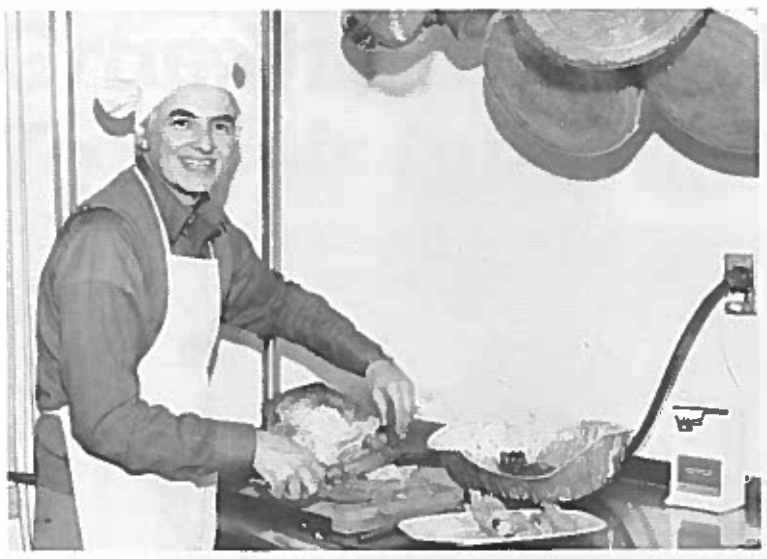
Learn And Earn. *Paul Holt of Corporate Services used the tuition reimbursement program to help pay for his MBA.*

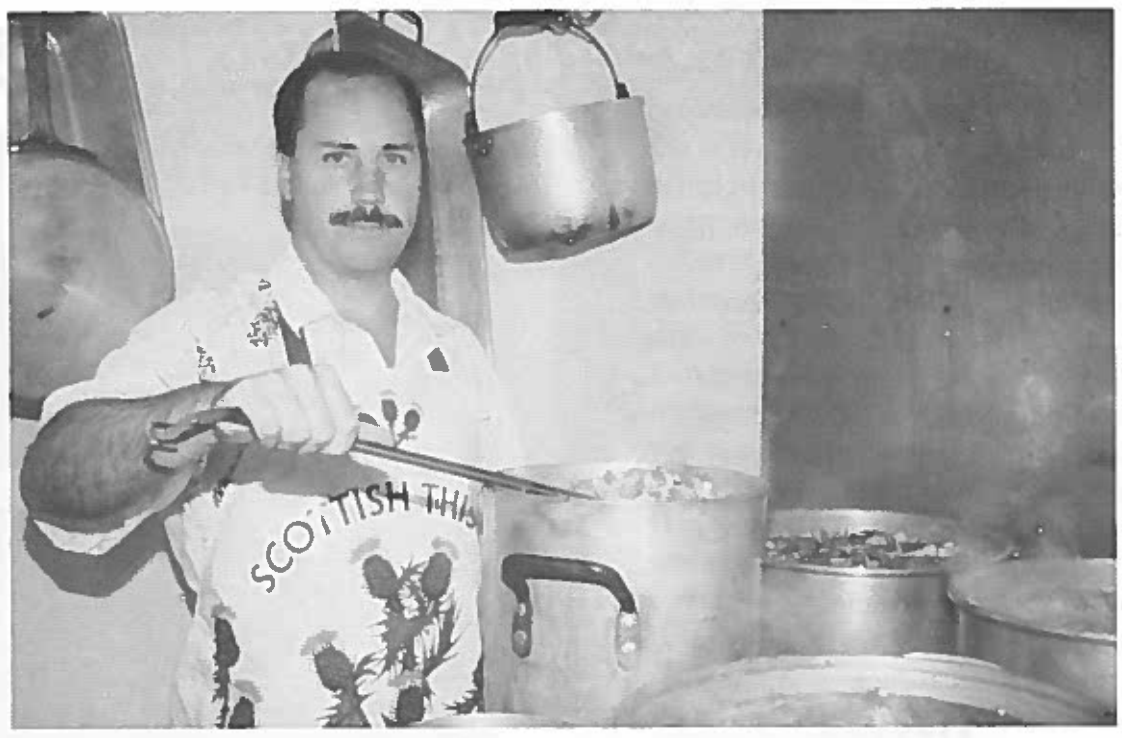
Earning An MBA The Cost Efficient Way

When Paul Holt had his interview with Grumman a couple of years ago, he asked more questions about the tuition reimbursement program than he did about medical coverage.

"I was two-thirds of the way towards my MBA," says Holt, a technical analyst in Procurement with Corporate Services in Bethpage. "At my age, I figured to spend a lot more money on tuition than on supplementing my medical coverage. Fortunately, Grumman has a terrific reimbursement program — it paid for virtually all my remaining credits."

This January, Holt was awarded his master's of business administration from Adelphi University in Garden City, New York.





Chefs For A Day. *Grummanites Joe Lutz (above) and Frank Van Langen prepare Thanksgiving dinner at community-based kitchens in Farmingdale, New York, and Melbourne, Florida.*

Caring For Their Communities: Grumman Volunteers In Action

Feeding The Hungry

Most Americans get enough to eat, but Joe Lutz and Frank Van Langen are concerned that some people often can't afford a hot meal. Both Grummanites volunteer at community-based kitchens.

Lutz, a project manager for Data Systems in Bethpage, helps cook Thanksgiving dinner at King's Kitchen in Farmingdale, Long Island. The kitchen is sponsored by his church.

"I help collect food for the kitchen all year," says Lutz, "but on Thanksgiving I put on an apron and help with the cooking and carving."

Lutz arrives early Thanksgiving morning and, along with other church members, helps prepare a full spread — from the turkey to the home-baked pies — for 50 to 60 people.

"Helping others enjoy Thanksgiving makes mine more satisfying," says Lutz. "I look forward to it every year."

Van Langen is a project engineer at Melbourne Systems in Florida. He helps out at the Daily Bread, a local community kitchen that feeds 80 to 150 people every day.

"I started off serving meals and was quickly promoted to cook," says Van Langen. "Seeing the people we serve has really inspired me. There was a young family that was obviously having a tough time. The look of appreciation in their eyes was enough reward for any volunteer."

Working With Vinton's Youth

Though it takes up a lot of their free time, Pam Cassell and Belinda West believe that their volunteer work with the Vinton Booster Club in Roanoke County, Virginia, is well worth it.

"The youth recreation club provides lots of activities for the children in Vinton. Keeping them busy keeps them out of trouble," says West, an executive secretary at Grumman Emergency Products in Roanoke.

"We have a full slate of activities," says Cassell, who's a Grumman accounting clerk. "We know the kids appreciate it, because so many kids show up. By getting to know them, we're in a better position to help if they need some extra attention."

West has been a coach and coordinator for the Vinton cheerleaders for two years. She spends about 12 hours a week working with 150 youngsters. "I set up schedules, make up squads and organize clinics," she says. "It's a lot of work, but it's also a lot of fun, so the time goes fast."

For the past five years, Cassell has also spent about 12 hours a week as cheerleading coach, assistant baseball coach, umpire and team mother. "A team mother gives out cokes after the game — and sometimes a shoulder to cry on," she says. "One of the things that I like best about the club is that there are no tryouts and no rejections. Any kid who wants to play gets to."

Making Glen Cove Better

Bill Johnson is deeply committed to improving life in his hometown of Glen Cove on Long Island. He is a supervisor in the tool fabrication department in Aircraft Systems.

When Johnson was growing up in Glen Cove, he and his pals went to the local clubhouse for Boy Scout activities and for baseball and football. Today, the club is called the Boys and Girls Club of Glen Cove. For the past 20 years Johnson has been a member of its board of directors.

"Today's youngsters have it much tougher," says Johnson. "They face problems like drug abuse that didn't exist for me. The Boys and Girls Club gives them a healthy environment to have fun in and to get help with their problems."

The club offers recreation, tutoring, career guidance and drug abuse prevention programs to the town's young people. Johnson spends about four hours a week helping to set up and administer programs. "I don't have a shadow of a doubt that we're keeping some youngsters out of trouble by keeping them pointed in the right direction," he says.

Johnson has also been a member of the board of the Glen Cove Housing Authority for some 18 years and he's president of the Fair Housing Development Fund. In both posts, he helps the town's low and moderate income families with their housing needs.

"When my wife and I searched for affordable housing as newlyweds, we encountered so much discrimination that it made me want to help others avoid that kind of treatment," says Johnson. "Both housing programs are strictly non-discriminatory — the only test for participation is based on income. The purpose is provide affordable housing with dignity."

Diving For Life

For the past seven years, Don Pickle has served as a volunteer with the Middle River (Maryland) Volunteer Ambulance and Rescue Squad. His specialty is underwater rescue, and he has participated in many rescue efforts — often involving young children who have fallen through the ice.

"There's a lot of water in the area for kids to get into trouble," says Pickle, a machine operator for Aircraft Systems in Glen Arm. "Unfortuately, most of the time, we arrive too late. The death of a child is very sad and tragic for the family. But I do it because I know that someday I'll be there in time ."

Last year, Pickle and his fellow divers arrived too late to save three children from one family. The three fell through the ice at a local quarry. After pulling the last child from the frigid, murky water, he was so shaken that he decided to call it quits. But while attending the children's funeral, his unit got a call for another ice emergency, and Pickle swung back into action with the rest of his squad.

Since the quarry incident, Pickle and his fellow rescuers are actively working to prevent ice tragedies by visiting local elementary schools and putting on a play about water safety procedures.

"Children find ice irresistible," he says. "Some are going to go on it no matter what you say. So we concentrate on what to do if the ice starts to break. And we tell them that if they're on shore and their buddy gets in trouble, find a neighbor and call 911 before doing anything else. That will get us there all the sooner."

Helping The Homeless

Once a month, Mike Verrett goes to Plaza Park in Oxnard, California, bearing food and clothing for homeless people. Verrett, who's a stock clerk for Aircraft Systems, collects most of the items from his co-workers at Pt. Mugu.

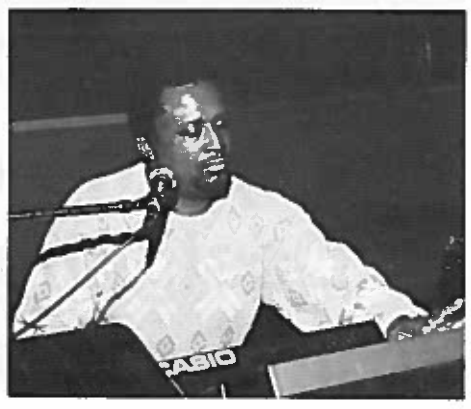
"Most of my co-workers know about my

Helping Others. *At left, Pam Cassell (L) and Belinda West work with the young people of Vinton, Virginia. Below, Stuart's Hurricane Hugo volunteers were (L to R) Jan Besanceney, Joe Jeransky, Judy Amacher, Joe Schneider, Dennis Jones, Skip Hall, and Ralph Panetta.*

ministry," says Verrett, a minister at the New Beginnings Christian Center in Oxnard and also a musician. "They've been great about supplying the things that people in the street need — decent clothes and a decent meal. Right now, I'm getting some fine coats for my next visit to the park on December 16."

In addition to the homeless, Verrett works with young people through the California Youth Authority.

"The young face tremendous problems between drugs and gangs," he says. "I use my music — contemporary gospel — to send them the message that there are alternatives, and they've been very responsive. Gang members regularly attend our services."



Community Service. *At left, Bill Johnson (2nd R) is president of a moderate income housing complex. Also pictured are Craig Osborne of Corporate Services with son Kristopher, age 4, and complex manager Mary Davis. Above, Mike Verrett uses music in his youth work.*

Helping Hugo's Victims

Some Grummanites do long-term volunteer work and others react to unanticipated events, like the devastation caused by Hurricane Hugo. Grummanites at three Florida sites joined forces to help the people of McClellanville, South Carolina, recover from the storm.

Their work began when Stuart's Dennis Jones learned that most of the aid was going to Charleston and that outlying areas were being neglected. Jones' discovery led to a joint venture, involving Grummanites from Stuart Operations, Melbourne Systems Division and St. Augustine Operations.

Stuart held a three-day food drive. "We collected lots of clothing, canned food, baby food, pillows and blankets," says Judy Amacher, who helped coordinate the drive. Volunteers loaded a trailer truck with box upon box of goods.

Skip Hall and Ralph Panetta gave up some vacation time to go north with the truck. They left at 3:30 in the morning. "It rained through the whole state of Florida," says Hall.

They stopped at Melbourne to pick up more donations. Farther north on Interstate 95 they met up with St. Augustine's tractor trailer driven by Rocky Leone and Richie Hughes. About 3:30 in the afternoon, they arrived in McClellanville.

Hugo had hit the town hard. The water line on the school's walls was eight feet high. Many of the homes had been blown down. People were outside heating canned foods over campfires.

"There were some very unfortunate people there," says Panetta. "Most of what they had was lost or destroyed. They were real glad to see us. That could have *been* us."

Coming Soon: A Grumman Volunteer Corps

Corps Organizers. *Members of the Employee Contribution Council's Advisory Board are (L to R) Norma Aschner, Al Wallace, Harry Volz, Bernie Arnold, Linda Warren, Debbie Anello, John Brody, Sharon Grosser, Bill Johnson, and Vincent Milano. Floyd Cisco was unavailable for photo.*

Efforts are under way to organize a corps of Grummanites dedicated to serving their community as volunteers.

"The idea is to give Grumman people the opportunity to work on short-duration volunteer programs," says Al Wallace, chairman of the Employee Contributions Council's Advisory Board, which is spearheading the corps' organization. "The activities will normally involve an evening, a Saturday or at most a weekend. A good example is our food drive on Long Island in February. We'll need help with the distribution of food packages to homeless individuals on the evening of February 14. That will be the corps' first activity."

Although the details are not yet final, nonprofit organizations needing short-duration help will request it through the soon-to-be-established Volunteer Action Center, which will notify corps members of the volunteer opportunities. "There will be no pressure or obligation to participate in any event," says Wallace.

After a Long Island corps is up and running, the advisory board will assist off-Long Island locations that wish to set up similar programs.

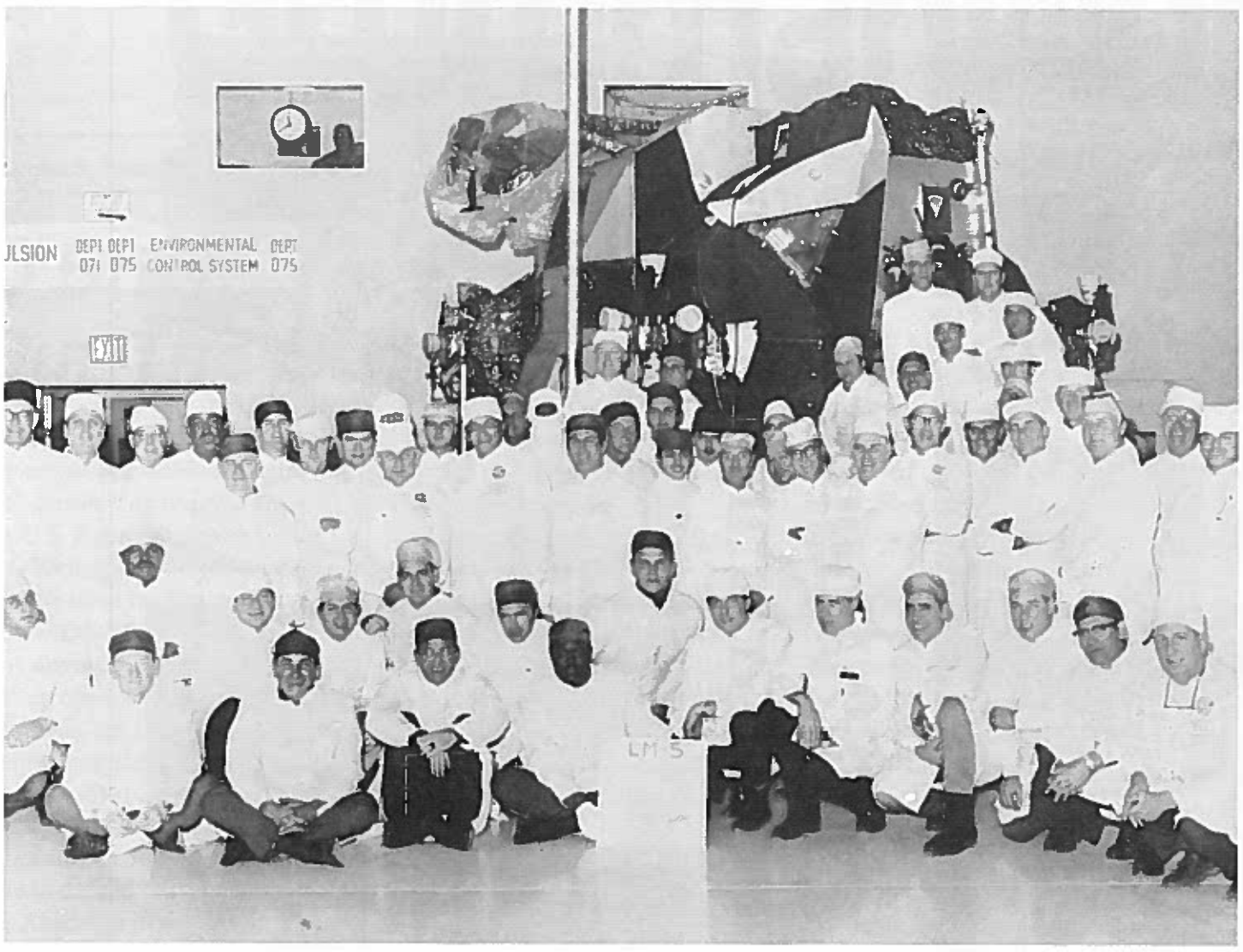
Right now, the search is on to find a name for the corps. Any suggestions can be sent to Sharon Grosser, manager of the Employee Contribution Council, A33-GHQ.

Early Birds. *Grumman prospered in spite of the Depression by carving out a niche as a producer of aircraft for Navy carriers. This photo was taken in October, 1936. At the time, F3F-1 biplane fighters had begun rolling off the Grumman assembly line.*

Happy Anniversary! Grumman Marks 60 Years Of Designing And Building Quality Products — From Pontoons To Lunar Modules To Tomcats

A Patriotic Era. *The 1940s was a booming period at Grumman. Production revved up to meet the demand for aircraft to fight World War II. This group was photographed in 1942 with part of the last F4F Wildcat produced by Grumman. The Wildcat pioneered an invention of company founder Leroy Grumman: the folding wing, which enabled more planes to occupy a carrier deck. The manufacturing of Wildcats and TBF Avengers was turned over to General Motors because Grumman became very busy making other aircraft, most notably the F6F Hellcat. Production reached an all time high in March 1945, when 664 Hellcats and other Grumman planes were produced for the Navy.*

'50s Prosperity. *The Cold War of the 1950s put additional emphasis on antisubmarine aircraft, due to concern about the growth of the Soviet fleet. These Grummanites were all smiles as they posed in front of one of the first S-2 Trackers, an antisubmarine aircraft built for the Navy. These planes were the predecessors of today's airborne early warning aircraft. The S-2's are still in service in about a dozen foreign countries.*



Triumph Of The Century. *Grumman had a key part in the what has been called the most important technological accomplishment of the century: on July 20, 1969, the Grumman-built Lunar Module (LM) landed men on the moon. This crew built LM-5, which brought astronauts Neil Armstrong and Buzz Aldrin to the moon's surface. These Grummanites wore special clothing during assembly of the LM, to prevent dust contamination. In all, Grumman built 12 LMs and a variety of test articles for the Apollo program. Six successful lunar landings took place, the last in December of 1972.*

Tomcat Meets The Mark. *Calverton Operations was the site of the "Big Push of '73," a successful project to increase productivity on the F-14 program. Due to the inflation that occurred between the time the contract was awarded in the late 1960s and the early 1970s, Grumman began losing money on the F-14. Former company chairman Clint Towl renegotiated the F-14 contract with the Navy. The Calverton production and flight delivery crews worked extra hard to get the program back on schedule. They met their target: all aircraft through no. 54 were delivered to the Navy, and five others achieved flight status by the year's end.*

Today's Technologists. *In the 1980s, while continuing its airframe business, Grumman has applied its systems integration skills to the defense electronics market. These Grummanites had their photo taken in 1987 in front of the Joint Surveillance Target Attack Radar System (Joint STARS) aircraft in Melbourne, Florida. Grumman is developing this airborne system for the Army and Air Force. It will detect and locate ground targets and guide aircraft and missiles against enemy armored and support forces.*

GrummanWorld

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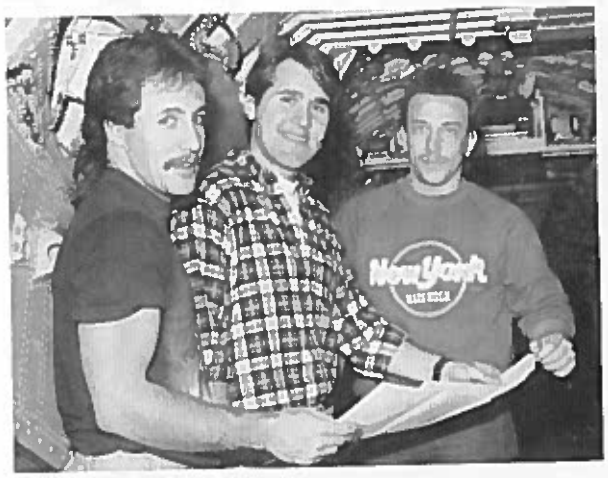
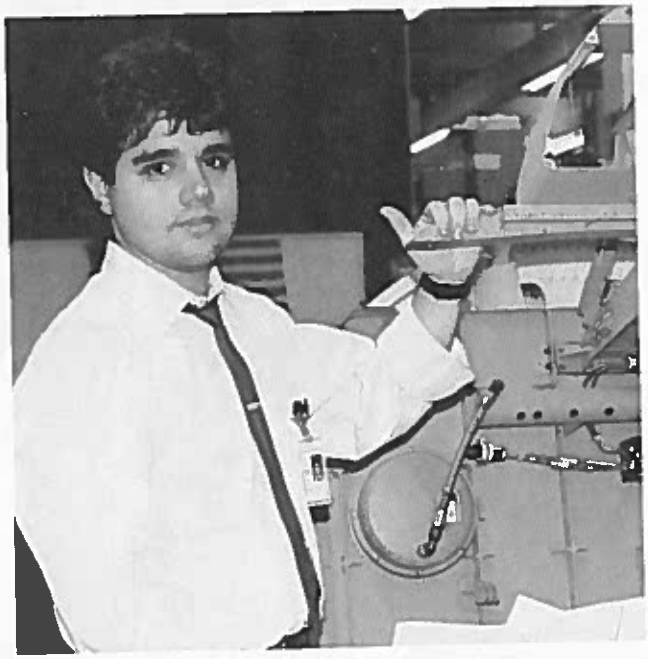


1989 Annual Report For Grumman People



An Exceptional Group. *This issue of Grumman World is dedicated to everybody who contributed to Grumman's success in 1989. On the front cover are: (clockwise) Artie Foley, Dan Jagiello, and Scott Simpson of Aircraft Systems, Bethpage, Long Island; Kerry Adams of Electronics Systems, Bohemia, L.I.; Craig Flaherty of Aircraft Systems, Calverton, L.I.; and Mike Belfiore and Lonnie Garrett of Data Systems' InfoConversion unit, Woodbury, L.I. On this page are: (clockwise) Irene McIntyre of Aircraft Systems, Calverton, L.I.; Lisa Ann Accardi of the Aerostructures unit, Melville, L.I.; Art Eisenhuth of Electronics Systems, Bohemia, L.I.; and Fred Wilkens of Data Systems, Holtsville, L.I.*

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